Chapter 9:
Waste Sector

by Roxane Auer and Holly Myers
I. Overview of Sector and Key Climate Policies

The waste sector, which includes waste management and recycling comprised 2 percent of statewide emissions in 2017. Exhibit 9.1 shows the importance of emissions from waste as a share of total emissions.

Exhibit 9.1. Waste Sector Emissions (MMTCO2E) as of 2017


The Scoping Plan expects emissions to keep rising in this sector but identifies measures to limit the growth of emissions significantly. Exhibit 9.2 shows emissions from the waste sector in 1990 and 2017 and finally, the estimated range of emissions in 2030 from implementing the measures identified in the Scoping Plan. Missing from this figure are the expected emission reductions from the Cap-and-Trade Program. Since this market-based program covers all large sources of greenhouse gas emissions across sectors and does not predetermine where emission reductions will occur, its projected impact in each sector cannot be illustrated.
Since 1989, when California enacted the Integrated Waste Management Act (IWMA; Assembly Bill 939, Sher, Chapter 1095 Statutes of 1989),\(^1\) the state has led the nation in mandating a decrease in the quantity of solid waste it sends to landfills. Established in 2011 by Assembly Bill 341 (Chesbro, Chapter 476, Statutes of 2011),\(^2\) 75 percent of all waste generated must be source-reduced, recycled, or composted by 2020. The IWMA also established a statewide permitting, inspection, and enforcement structure that later became the California Department of Resources Recycling and Recovery (CalRecycle), the agency currently responsible for implementing the state’s climate policies in the waste industry. In 2016, California established a statewide target for organic waste (Senate Bill 1383, Lara, Chapter 395, Statutes of 2015),\(^3\) mandating a 75 percent reduction in organic waste disposal from 2014 levels by 2025 as part of the state’s Short-Lived Climate Pollutant (SLCP) reduction strategy to phase in organic waste recycling requirements by 2022.\(^4\)
The waste sector’s most significant impact on climate change is from the large quantity of methane emissions produced by landfills. Within CARB’s greenhouse gas inventory, emissions from the waste sector consist of methane and nitrous oxide, with methane being the primary contributor, from landfills (94 percent) and from commercial-scale composting (a small fraction). The sector emitted 8.85 million metric tons of carbon dioxide equivalent (CO2e) in 2014, approximately 2 percent of the state’s total annual greenhouse gas emissions.

Almost all methane emissions from the sector are derived from the landfill disposal of organic waste, which comprises two-thirds of all landfilled material. Organic waste includes compostable materials such as food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper; additionally, materials like cardboard and paper are organic in nature but are typically recycled as commercial commodities rather than through composting. Diverting plastic, glass, and aluminum materials from landfills to recycling facilities also serves to reduce greenhouse gas emissions from the waste sector, although indirectly because reuse and remanufacturing generate fewer emissions than manufacturing from virgin materials. While increasing recycling remains an important part of the state’s greenhouse gas emissions reduction strategy, diverting organic waste from landfills is the priority because it reduces methane (a Short-Lived Climate Pollutant, SLCP) emissions directly.

As an essential component of SB 1383, CalRecycle is implementing a strategy to ensure that by 2025, local jurisdictions prevent at least 75 percent of all organic waste from ending up in a landfill and reduce by 20 percent the edible food destined for landfills. When fully implemented, the organics diversion and food waste prevention and rescue programs will reduce methane emissions by an estimated 4 million metric tons of CO2 equivalent by 2030.

CalRecycle has not seen a meaningful decrease in the per-capita amount of material that ends up in the landfill since 2009, despite the state continuing to push toward new and more aggressive diversion targets. Indeed, 2016 marked the fourth consecutive year in which per-capita disposal increased. In addition, the state’s rate of diversion (i.e., the percent of waste that is diverted from landfills to recycling, composting, and other uses) has gone down in recent years, from 50 percent in 2014 to 44 percent in 2016.

There is urgency at the state level to correct this trend and move meaningfully toward the 75 percent diversion target by 2020 established by AB 341. In order for California to reach the 2020 mandate, more than half of the solid waste that is currently disposed of in landfills would need to be reduced, recycled, or composted. Reaching this target would require rapid growth in diversion programs and in the development of facilities for processing waste at the local level. Increasing diversion and building new facilities for diverted materials could contribute to significant job creation—from entry-level jobs to advanced, professional careers—because of the steady flow of committed and skilled labor.
workers that would be needed to process and remanufacture the additional waste. In addition, waste diversion is more complex and creates more jobs than landfilling.\textsuperscript{11}

Waste management has historically been provided or managed by local governments and is generally viewed as a core local governmental responsibility.\textsuperscript{12} Throughout the history of the industry, waste workers employed by a public entity, those who are members of a union, and especially, waste workers who are both have had the ability to make gains in working conditions and pay. The sanitation workers’ strike in Memphis, Tennessee, that Dr. Martin Luther King, Jr. famously attended in his final days was sparked by the death of two sanitation workers on the job and workers’ subsequent demand that the city recognize the union, improve safety, and raise wages.\textsuperscript{13} After Dr. King’s assassination, the city recognized the union and agreed to higher wages, and organizing efforts by sanitation workers elsewhere led to better job quality in this industry.

In more recent years, new labor and workforce challenges have arisen as subcontracting has become more prevalent in the waste industry. Wages and working conditions for public sector sanitation workers continue to generally be decent. Subcontracting, however has reduced California’s share of public workers in the waste management and remediation industry to only 1.6 percent.\textsuperscript{14} In the private waste hauling industry throughout the United States, including in California, there are long-standing low-road employment practices, such as insufficient training, dangerous working conditions, long and inconsistent shifts, and wage theft.\textsuperscript{15} In this environment, employees cannot perform at their best, and this impact is evident in efficiency and diversion rates. For this reason, high-road employment practices and successful diversion go hand in hand. Employees who are well trained and well treated will stay on the job longer, gain more expertise, and perform higher quality work and/or be more productive.

Directly employing waste workers as municipal employees, as was more common in the past, might be the most effective way to ensure high-road labor and workforce development practices. Another method to improve employment (and environmental) outcomes in this sector would be to use the government contracting process to structure the market in ways that lead to high quality careers and increase access for disadvantaged workers. For instance, California could mandate or incentivize high-road training and employment practices for waste sector contracts involving state funds. Local governments are mainly responsible for waste services, however, which means municipalities and counties would need to integrate high-road labor practices via mandates or incentives in the bidding processes they oversee. Local jurisdictions could seek waste management contractors based on required high-road practices and a responsible contracting model.
The following key policies affecting the waste sector are the following:

**General Statewide Diversion Mandates and Goals**

- **Integrated Waste Management Act (Assembly Bill 939, Sher, Chapter 1095, Statutes of 1989)**

  Required 50 percent waste diversion by 2000, with a monitoring and enforcement system at the state level to ensure compliance. It was the first legislation in the country to prioritize source reduction and diversion, and it changed the way California approached waste management. The 2000 target was reached by most local jurisdictions.

- **Solid Waste Per Capita Disposal Measurement Act (Senate Bill 1016, Wiggins, Chapter 343, Statutes of 2006)**

  Required each jurisdiction to establish a 2002-2006 base rate of total waste generated in pounds/per person/per day, and required jurisdictions to landfill no more than 50 percent of that amount. The state began checking compliance in 2007 through a yearly report that each local jurisdiction was required to submit to CalRecycle. The timing of this change meant that local jurisdictions measured the base rate during the economic boom years and measured disposal rates just as the recession began in 2008. For this reason, the vast majority of local jurisdictions in California achieved their target immediately. Since then, however, the state has emerged from the recession and Assembly Bill 1594 (Williams, Chapter 719, Statutes of 2014) mandated a change in how alternative daily cover (ADC, non-earthen materials used to cover landfills) is counted as disposal, so for both reasons some local jurisdictions are expected to have trouble maintaining compliance without implementing new diversion programs.

- **75 Percent Statewide Recycling Goal and Mandatory Commercial Recycling (Assembly Bill 341, Chesbro, Chapter 476, Statutes of 2011)**

  Required 75 percent of solid waste generated to be reduced, recycled, or composted by 2020 and established more stringent requirements for what can be considered diversion. To achieve the 2020 mandate, the law required mandatory commercial recycling beginning in 2012, with the goal of recycling an additional 2 million to 3 million tons of materials annually by the year 2020. It required all businesses generating more than four cubic yards of commercial solid waste per week and all multifamily buildings of five units or more to institute a recycling program as of July 1, 2012. AB 341 authorized local jurisdictions to collect a fee to cover the cost of running the program and authorized districts to implement an enforcement program. CalRecycle reviews the actions of local jurisdictions and can impose penalties for noncompliance.
Direct Reporting Requirements (Assembly Bill 901, Gordon, Chapter 746, Statutes of 2015)\textsuperscript{25}

Provided CalRecycle with enforcement authority for existing disposal reporting requirements, thus enabling CalRecycle to accurately measure progress toward the 75 percent target.

Organic Waste Recycling

Mandatory Commercial Organics Recycling (Assembly Bill 1826, Chesbro, Chapter 727, Statutes of 2014)\textsuperscript{26}

Progressively tightened requirements for businesses generating a certain amount of organic waste.\textsuperscript{27} Initially, the requirements applied to businesses generating at least eight cubic yards of organic waste per week; as of January 1, 2017, the threshold was reduced to four cubic yards per week. If, in 2020, CalRecycle determines that organic waste disposal has not been reduced by 50 percent from 2014 levels, it will require compliance from businesses that generate at least two cubic yards of total solid waste per week. This change would leave very few businesses exempt. The law required local jurisdictions to have an organic waste recycling program in place by January 1, 2016, and to inform businesses of the requirement. The law also supports transportation biofuel development from organic waste. As of August 2017, local jurisdictions were required to begin including information on program implementation in their annual reports. CalRecycle has already begun to monitor compliance.

Compostable Organics (Assembly Bill 876, McCarty, Chapter 593, Statutes of 2015)\textsuperscript{28}

Addressed longer-term planning for organics infrastructure, requiring counties and regional agencies to report their organic waste output and processing infrastructure needs in the state’s Electronic Annual Report (EAR) beginning on August 1, 2017.

Organic Waste Composting Promotion (Assembly Bill 1045, Irwin, Chapter 596, Statutes of 2015)\textsuperscript{29}

Required CalEPA, in coordination with CalRecycle, the State Water Resources Control Board (SWRCB), ARB, and California Department of Food and Agriculture (CDFA) to develop and implement policies that divert organic waste from landfills through composting and appropriate uses of that compost.
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- **Bioenergy Market Adjusting Tariff (Senate Bill 1122, Rubio, Chapter 612, Statutes of 2012)**

  Created a bioenergy incubation program requiring the state’s three large investor-owned utilities (PG&E, Southern California Edison, San Diego Gas and Electric) to procure a share of the required 250 megawatts of renewable capacity from small-scale bioenergy projects that commenced operation on or after June 1, 2013.

- **Biomethane Pipeline Injection (Assembly Bill 1900, Gatto, Chapter 602, Statutes of 2012)**

  Established standards for biogas pipeline injection, requires gas producers to be responsible for the costs of biogas pipeline injection, and established a ratepayer-funded program of up to $40 million to assist the nascent biogas market with interconnection costs.

- **Short-Lived Climate Pollutant Reduction Strategy**

  - **Senate Bill 605 (Lara, Chapter 523, Statutes of 2014)**

    Required CARB to develop a strategy to reduce short-lived climate pollutants (SLCPs), including methane.

  - **Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)**

    Mandated CARB’s Short-Lived Climate Pollutant Reduction Strategy be implemented by January 1, 2018. It also specifically addressed the reduction of methane emissions from landfills through the diversion of organic waste. The strategy adopted by CARB requires CalRecycle to meet specific benchmarks for keeping organic waste out of landfills: 50 percent below the 2014 level by 2020, growing to 75 percent by 2025. It also specifies that not less than 20 percent of the edible food destined for the organic waste stream is to be recovered to feed people in need by 2025. CalRecycle is in the process of drafting regulations, which will be finalized and take effect by January 1, 2022. CalRecycle, in consultation with CARB, must analyze the progress that the waste management sector and state and local governments have made in achieving the 2020 and 2025 targets by July 1, 2020. As part of SB 1383, the California Energy Commission was required to develop recommendations regarding the production and use of renewable natural gas (RNG) as part of the 2017 Integrated Energy Policy Report (IEPR) and based on these recommendations, to adopt policies and incentives to increase sustainable production and use of RNG.
II. Industries and Occupations Affected

The main industry impacted by the proposed greenhouse gas emission reduction measures is the waste management and remediation service industry (NAICS 562). As of 2016, there were just under 48,000 workers in this industry in California. The vast majority of these workers are private-sector employees. Exhibit 9.3 shows the detailed 4-digit NAICS segments of this industry: waste management and remediation, waste collection and waste treatment and disposal. The occupational distribution in all three of these industry segments is very similar: the vast majority are blue-collar occupations.

Exhibit 9.3. NAICS Industries within Waste Management and Remediation Services

<table>
<thead>
<tr>
<th>Industry Segment</th>
<th>Professional</th>
<th>Blue Collar</th>
<th>White Collar</th>
<th>Managerial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Management</td>
<td>1</td>
<td>76</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Waste Collection</td>
<td></td>
<td>78</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Waste Treatment and Disposal</td>
<td></td>
<td>78</td>
<td>13</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: May 2016 OES Research Estimates by State and Industry [https://www.bls.gov/oes/current/oes_research_estimates.htm]

Exhibit 9.4 shows that the largest occupation within the waste management and remediation service industry in California is that of “refuse and recyclable material collectors,” the sanitation worker who collects trash, recyclables, or organic waste from residences and businesses. These workers drive or help on waste collection vehicles, and they account for 23 percent of all waste management and remediation service industry workers.

Waste processing workers, who sort the waste by hand and otherwise move or handle the material once it arrives at a waste processing facility, make up 10 percent of the industry. Material moving workers, those who use heavy machinery to move waste around, make up less than 1 percent. Waste processing jobs exist largely as
a result of diversion efforts, as these are the workers who process the waste that does not go to the landfill. A widely cited 2011 report by National Resources Defense Council estimated that of the jobs created by increasing California’s diversion rate to 75 percent, 31 percent will be created in materials collection and 24 percent in materials processing, while most of the rest are in manufacturing that uses recycled feedstock.36

Exhibit 9.4. Top 10 Occupations in Waste Management and Remediation Services

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Occupation Title</th>
<th>% Share of Occupations in Sector (NAICS 562)</th>
<th>Landfilling, Diversion, or Both</th>
<th>25th Percentile Hourly Wage</th>
<th>50th Percentile Hourly Wage</th>
<th>75th Percentile Hourly Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>53-7081</td>
<td>Refuse and Recyclable Material Collectors</td>
<td>23%</td>
<td>Both</td>
<td>$18.50</td>
<td>$22.50</td>
<td>$26.40</td>
</tr>
<tr>
<td>53-7062</td>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>10%</td>
<td>Largely diversion</td>
<td>$10.40</td>
<td>$12.70</td>
<td>$15.80</td>
</tr>
<tr>
<td>47-4041</td>
<td>Hazardous Materials Removal Workers</td>
<td>9%</td>
<td>N/A</td>
<td>$16.10</td>
<td>$19.10</td>
<td>$23.80</td>
</tr>
<tr>
<td>53-3032</td>
<td>Truck Drivers, Heavy and Tractor-Trailer</td>
<td>7%</td>
<td>Largely diversion</td>
<td>$17.10</td>
<td>$21.30</td>
<td>$25.00</td>
</tr>
<tr>
<td>49-3031</td>
<td>Bus and Truck Mechanics and Diesel Engine Specialists</td>
<td>3%</td>
<td>Both</td>
<td>$20.00</td>
<td>$24.10</td>
<td>$30.00</td>
</tr>
<tr>
<td>43-5111</td>
<td>Weighers, Measurers, Checkers, Samplers, and Recordkeeping</td>
<td>3%</td>
<td>Largely diversion</td>
<td>$15.00</td>
<td>$17.30</td>
<td>$20.10</td>
</tr>
<tr>
<td>47-4071</td>
<td>Septic Tank Servicers and Sewer Pipe Cleaners</td>
<td>2%</td>
<td>N/A</td>
<td>$15.00</td>
<td>$18.10</td>
<td>$23.10</td>
</tr>
<tr>
<td>47-2061</td>
<td>Construction Laborers</td>
<td>2%</td>
<td>Both</td>
<td>$24.80</td>
<td>$29.50</td>
<td>$39.50</td>
</tr>
<tr>
<td>47-1011</td>
<td>First-Line Supervisors of Construction Trades and Extraction Workers</td>
<td>2%</td>
<td>Both</td>
<td>$10.00</td>
<td>$11.70</td>
<td>$16.20</td>
</tr>
<tr>
<td>43-4051</td>
<td>Customer Service Representatives</td>
<td>2%</td>
<td>Both</td>
<td>$14.20</td>
<td>$17.50</td>
<td>$21.50</td>
</tr>
</tbody>
</table>

Source: May 2016 OES Research Estimates by State and Industry [https://www.bls.gov/oes/current/oes_research_estimates.htm]
The waste sector comprises residential hauling, commercial hauling, which are sometimes separate businesses, and waste processing which generally includes both commercial and residential waste. The commercial hauling segment includes all businesses, industries, and large apartment buildings (i.e., 5 units or more); residential includes single-family homes and small apartment buildings with less than five units. Material processing facilities include material recovery, composting, digestion, transformation (incineration), and landfilling. CARB does not include medical and hazardous waste in its consideration of this sector.37

There are two national, publicly traded companies with a large market share in California: Waste Management, Inc. and Republic Services, Inc. Regional companies comprise the rest of the industry, with some of these smaller firms operating in multiple states. Many companies operate in both residential and commercial waste, and often, the collection and processing of waste is vertically integrated within a single company.

Municipal waste services, where a local government entity hires waste workers directly, has all but disappeared. According to the U.S. Bureau of Labor Statistics, 98.4 percent of California’s waste management and remediation service workers are in the private sector, while only 1.6 percent are in the public sector.38 Most local jurisdictions have established a contracting process for securing both residential and commercial waste management services from private firms. This process involves the submission and evaluation of bids in response to a request for proposals (RFP), which allows local governments the opportunity to mandate or incentivize high-road practices should they choose to do so. Local jurisdictions often take a hands-off approach with waste haulers in the commercial sector; although licenses are required, they often have minimal stipulations. In these cases, the waste services contract is between the commercial client and the waste management company directly. Where it exists, this “open-market” or “nonexclusive” practice impedes attempts to improve diversion rates as well as employment practices, as explained below.

A handful of industries outside of waste will also be affected by the policies under discussion here. As the state moves forward with its organic waste recycling mandates, for instance, new facilities are likely to be needed to process the additional quantities of compostable organic waste, stimulating employment in the industrial building construction industry (NAICS 23621). There may also be a need for additional remanufacturing facilities that use recycled materials as feedstock, stimulating both the building construction and the manufacturing industries (NAICS 31-33).39 Organic waste, the primary focus of the state’s diversion policy drivers is cost-prohibitive to transport. As a result, with the exception of paper and cardboard, organic waste generated in California is typically managed entirely in California (currently through compost, anaerobic digestion, or landfill disposal). Recycling an additional 20 million tons of organic waste that are currently landfilled by 2025, as called for in SB 1383, is estimated to create 11,700 permanent jobs and more than 80 new or expanded compost or anaerobic digestion facilities according to CalRecycle.40 More detailed projections of employment growth would be highly speculative at this time.
In addition, CalRecycle’s new focus on food rescue has resulted in more funding for organizations involved in the operation of food banks. For that reason, the religious, grant-making, civic, professional, and similar organizations industry (NAICS 813) will also be impacted in a range of occupations. The funds already distributed for this program have been largely used for the purchase of equipment to safely store the food, and direct job growth is likely limited due to emphasis on investment in capital (i.e., food storage equipment) more than in labor.

III. Key Policies for the Waste Sector

The following section addresses the workforce issues embedded in the major climate policy areas in the waste sector. The section first examines the available evidence on current workforce outcomes. It then discusses the climate policy mechanism and identifies the additional workforce policy levers that the agencies responsible for implementing the climate policies can employ in order to create good jobs and the demand for skilled labor. It also highlights opportunities to develop, utilize, and leverage the state’s workforce development, training, and education infrastructure to prepare workers for the labor market changes that will occur due to climate policies in this sector.

A. Statewide Diversion Mandates

The main driver of industry change in the waste sector flows from state diversion mandates. CalRecycle is approaching the task of ensuring compliance with the statewide diversion mandates placed on local jurisdictions in multiple ways. The official strategies for achieving the state’s 75-percent diversion target are contained in CalRecycle’s AB 341 Report to the Legislature in 2015. These include moving organics out of the landfill; expanding the recycling/remanufacturing infrastructure (i.e., permitting, compliance assistance and financing); exploring new models for state and local funding of sustainable waste management programs; promoting state procurement of post-consumer recycled content products; and promoting extended producer responsibility, in which producers are obligated to take financial and/or physical responsibility for the treatment or disposal of post-consumer products.41

Diverting Organic Waste from the Landfill

Organic waste (i.e., compostable materials such as food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper) is the largest waste stream in California, accounting for nearly half of all solid waste generated annually in the state.42 Essential to both achieving the state’s diversion mandate and reducing methane emissions, the diversion of organic waste from landfills has been
at the center of many of the state’s waste-related policies. For instance, the state’s Short-Lived Climate Pollutant Reduction Strategy, approved in 2016, requires that local jurisdictions divert 75 percent of organic waste by 2025. Mandatory commercial organics recycling, passed in 2014, requires any business producing more than four cubic yards of solid waste per week to establish an organic waste diversion program.\(^\text{43}\)

The two main methods being used to divert organic waste from landfills are composting and digestion.\(^\text{44}\) In composting, organic material is allowed to break down in a controlled, open-air environment; in digestion, the material breaks down in a closed environment, such as a tank. Composting is aerobic (exposed to gaseous oxygen), whereas digestion can be either aerobic or anaerobic (deprived of gaseous oxygen). When the digestion process takes place in a closed environment, 100 percent of the methane produced by the decomposing material can be captured, which makes digestion superior to composting when considering the reduction of short-lived climate pollutants. Open-air composting does emit methane, although far less than landfilling. Incineration, which involves the burning of waste, is another organic waste diversion method, but is viewed as environmentally inferior to other methods and is not a target for growth.\(^\text{45}\)

Both composting and digestion can be used to produce environmentally friendly products. Composting produces mulch, fertilizer, and other beneficial soil additives. Digestion produces renewable natural gas (RNG) that can replace fossil natural gas and be used to directly to generate electricity or provide thermal energy, or RNG can be refined into a transportation fuel. Studies indicate that California could produce nearly 300 billion cubic feet of renewable natural gas per year from organic waste, enough to replace 75 percent of all the diesel fuel used by motor vehicles in the state.\(^\text{46}\) Composting facilities are less expensive to build than digestion facilities, and both types of facilities face difficulties in finding locations and securing approval. For this reason, the state has recommended that, where feasible, existing, closed-environment wastewater processing facilities also accept and process non-solid organic waste (e.g., food waste and fats, oil, and grease).\(^\text{47}\)

Recycling, in addition to organic waste diversion, is important to meeting the state’s GHG emissions reduction targets, as well. Mandatory commercial recycling, implemented in 2012, was designed to achieve a reduction in greenhouse gas emissions of five million metric tons of CO\(_2\)e. It is impossible to track how much of the state’s current diversion rate is attributable to the recycling destined for remanufacturing versus the diversion of organic waste; local jurisdictions are not required to report recycling quantities and CalRecycle will not have statewide tracking of recycling until 2019. Nonetheless, it is clear that many local jurisdictions have already taken action on recycling whereas organic waste diversion programs are less common.\(^\text{48}\) Recycling is also limited by remanufacturing and infrastructure capabilities.

A CalRecycle analysis of diversion rates in the commercial waste sector illustrates the significance of organic waste diversion.\(^\text{49}\) Currently, the commercial sector in California
landfills 64 percent of its total waste, diverting 7 percent through curbside organic waste programs and 8 percent through curbside recycling. CalRecycle, however, considers 43 percent of this total waste to be recoverable through organics diversion (into compost or mulch) and 25 percent through recycling. The potential gain for organic waste (36 percent) is therefore considerably higher than the potential gain for recycling (17 percent).

?f. Expanding the Recycling/Remanufacturing Infrastructure

There are not enough remanufacturing facilities in the state to handle the recyclable materials being collected. Existing remanufacturing facilities in California are near capacity and still only handle 2.3 million tons of recyclable feedstock; the rest must be exported.\(^5\) The United States as a whole exports about a third of its recycling, nearly half of it to China.\(^51\) Shipping recyclable materials to other states or nations is not the best choice for decreasing greenhouse gas emissions. It also subjects California to market volatility. In January 2018, for example, China tightened its standards and banned imports of various types of plastic and paper, wreaking havoc in the industry and leaving thousands of tons of recycled material with no place to go but the landfill.\(^52\)

To address the deficit in remanufacturing capacity, CalRecycle is working with businesses on multiple levels to assist in the development of additional recycling facilities. The 20-year-old Recycling Market Development Zone program, which includes tax breaks, incentives and attractive loans to manufacturers using feedstock from the waste stream, is one such initiative, though CalRecycle admits it is underfunded.\(^53\) The Legislature has allocated Greenhouse Gas Reduction Fund (GGRF) monies to support remanufacturing facilities through CalRecycle’s Organics and Recycling Manufacturing Loans and the Recycled Fiber, Plastic, and Glass Grants programs.\(^54\)

Similarly, there are not enough organic waste processing facilities in the state to handle the large increase in organic waste diversion that the state will require. In 2015, CalRecycle calculated that capacity for organic waste processing was less than one-half—perhaps only one-third—of what was needed to handle the mandated diversion.\(^55\) In 2015, California had 30 anaerobic food waste digesting facilities, which is nearly twice the number of such facilities in Wisconsin, the second-leading state, with 17 facilities.\(^56\) Some progress has been made: As of May 2017, at least 11 new anaerobic digestion facilities were either pending or in the permitting stage in California,\(^57\) however, more will be needed. A representative from CR&R—operator of the world’s largest anaerobic digestion facility, located in Perris, Riverside County—stated that about 50 more facilities are needed throughout the state.\(^58\) To assist with organic waste processing capacity, CalRecycle works with local governments, shepherding businesses through the approval processes and providing grants through its GGRF allocations.\(^59\) Development of new organic waste processing facilities remains a challenge, however, because multiple agencies are involved in the approval process and they maintain different, and sometimes even conflicting, requirements from one another, according to a consultant in the industry.\(^60\)
Promoting State Procurement of Post-Consumer Recycled-Content Products

The State Agency Buy Recycled Campaign program encourages state purchases of recycled-content products. Existing law requires each state agency to ensure that at least 50 percent of reportable purchases are recycled products, with the mandate extended to 75 percent of reportable purchases starting January 2020.\(^6\) However, only $200 million out of an annual $14 billion of total state spending on goods and services has been documented as spent on post-consumer recycled-content products.\(^6\) CalRecycle is exploring ways to improve this program.

Exploring New Models for State and Local Funding of Sustainable Waste Management Programs and Promoting Extended Producer Responsibility

Both these CalRecycle strategies face obstacles due to current costs. Diversion at the scale the state has mandated will be expensive, as the waste management industry has externalized environmental costs to date and local jurisdictions have emphasized lowest-cost when evaluating bids for waste management services. Improving wages and working conditions and instituting more professional behavior in the industry can help improve operational efficiency, but in the current environment, there is a danger that the low cost of landfilling will continue to win out unless mandates are strictly enforced.

CalRecycle is exploring new models for state and local funding of sustainable waste management programs. This includes exploring a strategy known as extended producer responsibility, or product stewardship, which is intended to place a shared responsibility for end-of-life product management on the producers and other entities involved in the product chain, instead of the general public.\(^6\) The statutory authority to make product stewardship the norm has not yet been established. Alternatively, increased allocations from the GGRF and other public (i.e., state and local) funding mechanisms could support new waste processing facilities. If nothing is done, the cost of the state’s diversion mandates are likely to fall on residential and commercial producers of waste and local governments will likely be forced to take the unpopular step of raising rates.

CalRecycle Enforcement of State Diversion Mandates

Local governments have been tasked with enforcing state diversion mandates, and CalRecycle has the right to investigate and impose financial penalties on local governments if they do not comply. Local governments have broad authority to establish enforcement programs and institute fees to fund an increase in diversion programs and processing facilities, whether as a direct fee on producers of waste or as a fee paid by haulers that is then passed on to producers. However, increased fees are politically
unpopular. The Los Angeles City Council recently included requirements for increased diversion and high-road employment practices in a new exclusive franchise program on the commercial side of the industry, and city officials faced anger from the business community when the program resulted in an increase in rates.64 Oakland experienced a similar problem.65

In January 2017, a letter from Scott Smithline, director of CalRecycle, to all statewide elected officials and recycling coordinators communicated the urgency with which the state intends to move forward with its diversion mandates.66 The letter makes clear that if at a minimum, a jurisdiction is not making a good faith effort to implement mandated diversion programs, CalRecycle will initiate a formal public review sooner rather than waiting until the end of the regular four-year review cycle.

**Greenhouse Gas Reduction Fund (GGRF) Allocations**

By the end of Fiscal Year 2017-18, CalRecycle had received a cumulative amount of $111 million from the GGRF for waste diversion efforts,67 which were used to fund the following programs: the Recycled Fiber, Plastic, and Glass Grant Program for supporting the development of remanufacturing facilities; the Organics Grant Program for supporting the development of organic waste processing facilities; and the Food Waste Prevention and Rescue Grant Program to get edible food otherwise destined for the landfill to those who need it.68 The Organics Grant Program has received the majority of the above funds. In the 2017-18 funding cycle, the following projects were funded through this program (see Exhibit 9.5).

**Exhibit 9.5. Projects Funded through CalRecycle’s Organics Grant Program 2017-18**69

<table>
<thead>
<tr>
<th>Grantee and Partners</th>
<th>County</th>
<th>Project Description</th>
<th>Total Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arakelian Enterprises, Inc. (DBA Athens Services)</td>
<td>San Bernardino</td>
<td>Upgrade Victorville windrow composting facility to an aerated static pile composting system to increase capacity, reduce air emissions, and help protect water quality.</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Best Way Disposal Company, Inc. (DBA Advance Disposal Co.)</td>
<td>San Bernardino</td>
<td>Equipment upgrades at material recovery facility in Hesperia to remove contaminants from organic waste to divert the clean material for composting.</td>
<td>$2,481,250</td>
</tr>
<tr>
<td>Burrtec Waste Industries, Inc.</td>
<td>Riverside</td>
<td>Construction of new covered composting system at Robert A. Nelson material recovery facility and transfer station near Riverside.</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Grantee and Partners</td>
<td>County</td>
<td>Project Description</td>
<td>Total Award</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Contra Costa Waste Services, <em>partnering with Food Bank of Contra Costa and Solano</em></td>
<td>Contra Costa</td>
<td>Purchase of new equipment and infrastructure upgrades at Mount Diablo Resource Recovery park to utilize existing anaerobic digesters for increased organic waste landfill diversion and biogas production. Includes a food rescue partnership with Food Bank of Contra Costa and Solano.</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>CR&amp;R Incorporated</td>
<td>Riverside</td>
<td>Third of a three-phase project at a current anaerobic digestion facility in Perris. Expansion increases organic waste landfill diversion and increases biofuel used to fuel CR&amp;R vehicle fleet.</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>Recology Yuba-Sutter</td>
<td>Yuba</td>
<td>First of a three-phase project to construct a new compost facility at Ostrom Road Landfill. This project received $2.8 million in a previous grant cycle.</td>
<td>$216,865</td>
</tr>
<tr>
<td>Santa Barbara County</td>
<td>Santa Barbara</td>
<td>Develop an anaerobic digestion facility at the Tajiguas Landfill to process currently landfilled organics into biogas and compost.</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>Upper Valley Disposal Service, <em>partnering with Sacramento Food Bank and Family Services</em></td>
<td>Napa</td>
<td>Construction of new “organics blending barn” to mix food, green, and wood waste for composting. Includes a food rescue partnership with Sacramento Food Bank and Family Services.</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Waste Management of Alameda County, Inc., <em>partnering with Alameda County Community Food Bank</em></td>
<td>Alameda</td>
<td>Purchase of pre-processing equipment for a new organic material recovery facility in San Leandro. Separated materials will be composted at a new facility co-located at the Davis Street complex. Includes food rescue partnerships with Alameda County Community Food Bank.</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>West Coast Waste</td>
<td>Madera</td>
<td>Construction of a new aerated static pile composting facility to divert currently landfilled organic material. This project received $1.2 million in a previous grant cycle.</td>
<td>$161,326</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$25,109,441</strong></td>
</tr>
</tbody>
</table>
One example of an initiative funded in part by CalRecycle’s Organics Grant Program is an anaerobic digestion facility in Perris, Riverside County.\textsuperscript{70} The facility, which became fully functional in April 2017, produces enough renewable natural gas to displace four million gallons of diesel fuel, and the liquid and solid material left over from the process is turned into 260,000 tons of natural fertilizer.\textsuperscript{71} CR&R, the waste company that partnered with the city to develop the digester, plans to fuel 900 of its waste collection vehicles from the RNG produced at the site.

In conclusion, there are significant challenges in meeting the state’s diversion targets. In its 2015 report to the Legislature, CalRecycle noted that its annual funding is not enough to cover the overall effort to reach 75-percent diversion by 2020.\textsuperscript{72} The GGRF only partially fills the funding gap. With landfilling and fossil natural gas priced very low, and the cost of building waste processing facilities high, renewable natural gas is not economically competitive enough to spur private investment, though it promises large returns in methane emission reduction. Funding for the promotion of remanufacturing development, to support the state’s recycling mandates, is also lacking as the Recycled Fiber, Plastic, and Glass Grant Program has not received funding since 2016-17. Without complementary funding, state waste mandates will be difficult to enforce upon local authorities who must gain support from residents and businesses for unpopular rate increases.

1. **Workforce Outcomes from Statewide Diversion Mandates**

   **a. Job Growth**

   Evidence suggests that far more jobs will be created through diversion than have been created through landfill disposal.\textsuperscript{73} There have also been some perhaps overly optimistic estimates of the number of jobs yet to be created. In a 2014 report for the Natural Resources Defense Council, Tellus Institute estimated that achieving California’s 75-percent diversion goal, as established in AB 341, could create 110,000 direct jobs.\textsuperscript{74} More than 34,000 of these jobs would be in materials collection, 26,000 in materials processing, and 50,000 in manufacturing using the recovered materials, although not all manufacturing jobs will necessarily be in California. The same report predicts 14,000 direct jobs in organic waste diversion. In an analysis of the mandatory commercial organic waste recycling law (AB 1826), CalRecycle estimated that composting creates an average of four jobs for every 1,000 tons of material diverted, approximately four times more than landfilling.\textsuperscript{75} When discussing job creation for an organic waste digestion facility with a capacity of 400 tons per day, a representative from the operator of the facility, CR&R, cites 50 temporary construction jobs, 25 permanent jobs for sorters and grinders who prepare the waste for the digester, and 10 permanent jobs for engineers and chemists who keep the digester operating properly.\textsuperscript{76}
This large anticipated job growth has not yet been realized. The total number of waste management employees, not including remediation and landfill workers, is up 7.6 percent from 2012. However, the Gross State Product grew by 15 percent during the same period, suggesting that it is the state of the overall economy, not diversion mandates, that is responsible for this job growth.

By 2017, when the CARB Scoping Plan was published, California’s diversion rate had actually declined, and similar potential job creation numbers were cited. This decline points to the primary limitation to significant job growth: in order to create jobs in the sector, California must figure out how to improve diversion and must keep processing and re-manufacturing jobs in-state. That said, much of the recent legislation requiring organic waste diversion is only now beginning to be enforced. The new laws and policies seem likely to improve diversion rates and therefore stimulate job growth.

### ii. Job Quality

The waste industry has both high-and low-road jobs. Among entry-level jobs, as a general rule, waste collection jobs are better quality, while waste processing jobs are lower quality. Waste collection jobs have existed longer, and workers have benefited from years of unionization efforts and public sector employment at the municipal level. Waste processing jobs are relatively new, created in response to diversion efforts that began in 1989 and are almost entirely non-union in California. Entry-level waste processing jobs are also the least-skilled jobs in waste management, and this characteristic has been exploited to drive down wages and working conditions significantly, and there is evidence of wage violations.

The waste processing workforce will have to grow in number and skill level to be able to meet California’s diversion targets. As described in this chapter’s introduction, in recent decades the subcontracting of this public service has led to a decline in wages and working conditions, just as California needs the industry to grow its capacity significantly. Low road labor practices are an impediment to skill development since they generally result in high turnover, and can lead to wasted investments in training when workers exit (See Chapter 3).

Waste collection jobs—including drivers and other workers on waste collection vehicles—are relatively good quality jobs, especially in California. In 2016, the 25th percentile hourly wage was $18.50, and the 50th percentile hourly wage was $22.50. These workers are often represented by the International Brotherhood of Teamsters and thus are more likely receive family health insurance benefits and pensions.

Employment in waste processing—which includes the workers who sort recyclables at material recovery facilities, grind organic waste for digestion facilities, and turn the compost at mulching facilities—is almost entirely non-union and, consequently, lower-wage than in waste collection. The occupation group “laborers and freight, stock and material movers, hand,” the bulk of waste processing workers, make a 25th
percentile hourly wage of $10.40 and a 50th percentile hourly wage of $12.70. The 50th and 75th percentile hourly wage for waste processing workers in 2016 are both above the California minimum wage, which was $11 per hour as of January 2018. It is also dirty and dangerous work. Furthermore, waste processing faces the most immediate pressure from increased automation in the waste sector, so worker bargaining power, already low, will only decrease as automation advances.

It is important to note that wage theft is common in the industry, affecting both waste collection and processing workers, and government wage data does not capture this problem. For example, some employers in the waste industry pay workers a flat rate for a certain route or for a “day,” regardless of the hours worked. Even when wages are decent, working conditions can be abusive. In 2015, the Partnership for Working Families conducted 57 in-depth interviews with waste workers throughout the country, 18 of them in California. Many of these workers reported insufficient gear, inadequate training, inconsistent schedules, long hours, abusive management, and being rushed to get dangerous work done faster, all of which increase safety problems in the industry and community. OSHA records show that the waste industry, including waste collection and processing, is dangerous, with injury and accident rates high compared to other industries.

These kinds of low-road labor practices often go hand in hand with poor recycling and composting practices, as businesses seek to push the cost of waste management as low as possible. In this environment, landfills will win out because it costs less than diversion. These race-to-the-bottom practices thrive where local governments do not manage the waste industry sufficiently and either seek lowest price practices in their contracting decisions, or choose non-exclusive contracting or an open-market system.

There are also examples of high road practices in the waste industry. Many local jurisdictions in California already have exclusive franchise systems; several local jurisdictions throughout the state are already taking steps to require high-road employment and business practices when they contract with waste management providers, such as those described in below in the two promising practices case studies. Clear best practices are emerging, and many more local governments could follow suit. One example of a high road approach has been initiated in Los Angeles, as described below in Promising Practice 9.1.

### iii. Job Access

The labor demand for waste collection and processing workers is likely to increase if California begins to make measurable progress toward the 75 percent diversion target. Yet there is no defined process by which an individual can seek employment in the waste industry. According to the Partnership for Working Families 2015 survey, access to waste jobs can be determined by who you know; a family connection to someone already in the industry is how some waste workers describe getting access. Waste collection jobs
are better paid than waste processing jobs, but remain hard to fill due to dangerous work, abusive conditions, and an increasing shortage of truck drivers as waste companies compete with the freight industry for workers. As has been emphasized throughout this report, improvements in job quality must go hand-in-hand with efforts to increase job access for disadvantaged workers, otherwise, the racial and gender inequities in the labor market will simply be reinforced.

Within waste processing occupations, low wages and dangerous working conditions make it hard to fill positions. Programs facilitating community access to waste processing jobs would help the industry meet its need for more workers to handle the large increase in waste diversion capacity, as long as improvements in wages and career paths also occur. GGRF grants to waste management companies to help with the development of waste processing facilities, mostly for organic waste, could require evidence of high-road business practices from an applicant before consideration for funding. Many of the companies receiving grants are large regional players that employ a large number of waste processing employees. Grants that can be as high as $3 million offer an opportunity to engage these businesses in a conversation about improving waste processing working conditions. As wages and working conditions improve, efforts to sustain or encourage employment of workers from disadvantaged communities can be initiated, as described below in Promising Practice #9.2.

iv. Risk of Job Loss or Job Degradation

There appears to be little to no risk of overall job loss or degradation in the waste sector at the current time. On the contrary, the urgency at the state level to meet the 75 percent diversion target, combined with the authority of local jurisdictions to charge fees or raise rates to fund increased diversion, point to continued growth in employment in the waste sector, particularly given that many of the timelines for enforcement are only getting started. Job growth will be stymied or limited, however, if the state cannot figure out how to adequately facilitate, incentivize, and enforce diversion.

There is potential for a small decrease or a plateau in the number of landfill workers. Current landfills will still need to be maintained, and any reduction in landfilling jobs due to diversion efforts will be offset by growth in the economy and the population.

It is also worth noting that the pressure to recycle more waste may speed up efforts already underway to automate the sorting process at material recovery facilities. It is much easier to automate the closed environment of a material recovery facility than to automate the waste collection process. If automation were to increase within material recovery facilities, the state’s climate measures could be partly responsible for displacing waste processing workers, some of the most vulnerable workers in the industry. It is unlikely that these workers will be able to easily transition to other jobs within the sector. Programs to help with such a transition could be considered if automation becomes more widespread. See Chapter 4 for more discussion of Just Transition programs.
PROMISING PRACTICE #9.1
Improving Waste Sector Working Conditions While Meeting State Diversion Mandates

In December 2016, the Los Angeles City Council finalized the adoption of the Zero Waste LA Franchise System, now known as recycLA. This new exclusive contracting process for commercial waste has the dual objective of improving waste diversion in Los Angeles and creating better job outcomes for local waste workers. The new contract requirements include streamlined truck routes, guaranteed recycling and waste tracking, standardized rates, and cleaned bins. They also require contractors to comply with a series of worker protection ordinances that the city council passed to ensure positive worker outcomes for contracted out city services. These include the city’s Living Wage Ordinance, Service Worker Retention Ordinance, Contractor Responsibility Ordinance, First Source Hiring Ordinance, and Labor Peace Agreement.

The Service Worker Retention Ordinance requires new city contractors to retain workers from a previous contractor. It was passed in response to repeated efforts by new city contractors to undercut the improvements in working conditions under previous contractors by firing large numbers of workers.

Contractors in Los Angeles are also required to provide outreach and training programs for potential new employees, sufficient training for existing employees, sufficient staffing levels, and health and safety program details and monitoring.

A new division of the Los Angeles Sanitation Department was created to enforce the new contracts, called the Solid Resources Commercial Franchise Division, allowing for a level of oversight that was all but non-existent in the city’s former commercial waste industry structure. These requirements are being touted as the nation’s toughest and are being studied carefully by New York City, San Diego, and other major cities. It is too early to measure results as Los Angeles’s ability to issue fines or cancel contracts to waste companies for lack of compliance only began in February 2018. In addition, higher city fees passed on to waste producers prompted a business group and a pair of apartment owners to file lawsuits claiming an illegal tax in 2017 and 2018, respectively, which has slowed but not stalled implementation.

The City of San Jose included many of the same requirements in its exclusive contracting process for both commercial and residential waste management, including compliance with the city’s living wage, prevailing wage, worker retention, job fair, and labor peace provisions, as well as service standards and personnel training requirements. A number of other cities—including Beverly Hills, San Jose, Azusa, and West Hollywood—require franchisees to comply with living or prevailing wage requirements, and several cities require employees to receive health benefits. Maywood, Carson, and Santa Ana have worker retention ordinances applicable to sanitation workers, adopted to ensure “seamless service” in case of a transition between waste companies.
2. Workforce Recommendations

a. Demand-Side Workforce Policy Levers for Job Quality and Job Access

- Use in-sourcing or exclusive franchise contracting models to support labor and environmental standards for public services.

The state has the opportunity to incentivize local jurisdictions to switch to either a municipal or an exclusive contracting model for commercial and residential waste services, and to eliminate open-market waste service systems that have produced low-road jobs and failed to meet waste diversion mandates. The most effective tool for improving both diversion rates and working conditions within the waste industry lies with local governments and their authority and capacity to regulate and monitor the industry. Where waste collection is carried out by private businesses, as it is in the vast majority of municipalities, local jurisdictions can establish exclusive franchise systems to institute and enforce both high-road employment practices and high diversion rates. In an exclusive franchise system, local governments limit participation to a predetermined number of businesses and engage in a bidding process, as illustrated in Promising Practice #9.1.

Local jurisdictions can set specific living wage and other labor standards. Alternatively, they can use procurement language to identify best value or best in class contractors by incorporating anticipated workforce outcomes in the criteria they use to rank bidders in competitive solicitations. In this way, local jurisdictions can avoid “lowest bidder” contracting. Companies that rely on being the lowest bid to get contracts often skimp on working conditions, safety, and service to make ends meet, as previously explained.

- Use responsible procurement policies for public procurement of large capital equipment and in CalRecycle grant programs.

Agencies or entities administering climate investment funds can use responsible procurement policies to incorporate workforce outcomes in the criteria they use to rank bidders in competitive solicitations. Awarding agencies can insert this language in solicitations for the procurement of large capital equipment.

CalRecycle provides tens of millions of dollars in grant funds to waste management companies for the development of waste processing centers and to remanufacturing companies for the development of facilities. In order for diversion efforts to be successful, and for job quality to be promoted, local municipalities need to exert more control over waste management systems and businesses. One way for CalRecycle to
ensure waste management systems reduce greenhouse gas emissions and support high-road employers is to limit grant funding to publicly-run waste management systems or to private waste haulers that are operating within an exclusive franchise system. Exemptions could be granted when specific mitigating circumstances are present; for example, for processing facilities in remote locations where there are limited options for local agencies. Ensuring that hiring programs exist for the surrounding communities, as part of the grant program guidelines, would improve access to these jobs. In all cases, if the GGRF is used to build new waste processing facilities, job quality requirements for waste processing workers can be attached.

- **Provide technical assistance to agencies implementing climate policy on how and when to apply these demand-side workforce interventions.**

The state can encourage increased diversion and improved employment practices by providing model language to local jurisdictions for contracting under an exclusive franchise system that includes policy levers for high-road employment practices. There is expertise in the state and among advocacy organizations and consulting firms on the development and enforcement of exclusive franchise contracts for waste management services.

- **Explore options to address rate increases for waste services due to climate mandates.**

Local jurisdictions must grapple with the need to increase rates for waste services as mandatory commercial recycling and composting are fully implemented, given an increased number of bins to be picked up, an increase in processing requirements, and the investment in facilities that is needed. There is a long-standing practice throughout California of keeping waste management rates as low as possible, while externalizing environmental and social costs. This creates challenges for local jurisdictions that lead the way towards better practices and need more resources to accomplish their goals. The recent opposition to rate increases from residents and businesses in Los Angeles and Oakland are cases in point. Responsible contracting policies that remove low-road actors from the waste sector can help improve service quality, which customers also value; state resources may also be necessary to achieve waste diversion targets and improve outcomes for workers.
b. Supply-Side Workforce Development Strategies

- Support the development of high-road training partnerships for contractors of municipal waste services.

High-road training partnerships should be encouraged as more waste workers will be needed in order to achieve mandatory commercial recycling and composting and 75-percent organic waste diversion. High-road training partnerships are collaborations among employers and unions, when they are present, and other partners such as community groups, community colleges, and other training institutions. In this case, high-road training partnerships can be used both to train incumbent workers on waste diversion, and to promote inclusion and advancement of workers from disadvantaged communities into high-quality jobs in waste. Such training partnerships are valuable once family-supporting wages and benefits have already been established; public investment in workforce training will be squandered where low wages and high turnover persist.

The Waste Industry Pre-Apprenticeship and Apprenticeship Program, partially funded by the California Workforce Development Board’s High Road Training Partnership initiative, is an industry-led partnership between Waste Management of Alameda County, Civicorps, and the Teamsters union. See Promising Practice #9.2. This type of effort, if implemented throughout California, would help ensure enough well-trained drivers, recyclers, and other waste diversion workers to meet the state’s targets and improve safety and efficiency in the industry.

B. Other Major Transformations of the Waste Sector

The push toward 75 percent recycling is expected to increase the need for workers at material recovery facilities and other waste processing facilities. Automation is already being tested successfully in this segment of the industry. In the next three to eight years, robots may take over many of the sorting and moving operations currently carried out by humans, bringing new jobs that involve the robot operation and repair, with a need for computer-literate employees. It would likely be difficult for a sorter to transition into working as a robot operator without significant prerequisites being completed prior to retraining. It is much easier for sorters to transition into waste collection jobs, although there are some requirements that can be a barrier, such as possessing a driver’s license.

It is unclear how fast automation will advance in the industry or how fast job growth will occur among waste processing workers. Therefore, it is important to monitor the situation: worker displacement is a real risk, if workers are hired in large numbers to meet the state’s diversion targets and a rapid increase in automation follows. Given the difficulty that waste processing workers will face in moving to other jobs within the industry, local or state programs that help them transition may be needed.
PROMISING PRACTICE #9.2
Waste Hauling Training and Hiring Program

In Oakland, along with diversion requirements and high-road employment requirements, the city also used an exclusive franchise process to require that its waste contractor, Waste Management of Alameda County, establish a training program for haulers in partnership with local unions and the community organization Civicorps. Through the Waste Industry Pre-Apprenticeship and Apprenticeship Program, local young adults—often adults without a high school diploma and from low-income communities—get training and job placement assistance so they can become unionized waste collection drivers after two years of paid training. Truck driver apprentices earn $20 an hour, and after two years, they are eligible for union jobs earning $70,000 annually, with benefits. Civicorps Executive Director Alan Lessik described the initiative as “the only city garbage franchise agreement in the country to include a nonprofit job-training program,” even though such programs can be an essential component of building the waste diversion workforce of the future.

As with improving diversion rates, the key to developing more initiatives like the Civicorps program lies with local jurisdictions and their willingness to engage in a “best value” contracting model that asks more of waste haulers than just low-cost services, including requiring haulers to provide training programs and access to jobs for disadvantaged community members. With this kind of effort from local jurisdictions, more people like Khris Bland can be given an opportunity to succeed. At age 20, Khris had already served a stint in jail and become a father. “I needed a job," he told the San Francisco Chronicle. “I needed to provide." Seven years later, he has graduated from the pre-apprenticeship program run by Civicorps, is working in Oakland as a paid Waste Management/Teamster apprentice, and is soon to be eligible for full employment with the company. “It’s a career I love," he said. “And I can send my daughter to college if she wants to go."
### IV. Key Recommendations for the Waste Sector

#### Exhibit 9.6. Key Recommendations for Waste Sector

<table>
<thead>
<tr>
<th>Demand Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>❖ Use in-sourcing or exclusive franchise contracting models to support labor and environmental standards for waste services.</td>
</tr>
<tr>
<td>❖ Use inclusive procurement policies for public procurement of large capital equipment and in CalRecycle grants programs.</td>
</tr>
<tr>
<td>❖ Provide technical assistance to municipal waste agencies on how to apply inclusive procurement policies and provide model contract language with best practice workforce policy levers and diversion enforcement.</td>
</tr>
<tr>
<td>❖ Explore options to address rate increases for waste services due to climate mandates.</td>
</tr>
<tr>
<td>❖ Use job impact metrics to measure the impact of waste incentive and investment programs on quantity of jobs, job quality and job access.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>❖ Support the development of high-road training partnerships for contractors of municipal waste services. These should target incumbent worker training for new waste diversion practices as well as creating pipeline programs for the inclusion and advancement of disadvantaged workers.</td>
</tr>
<tr>
<td>❖ Implement only where family-supporting jobs have been created.</td>
</tr>
<tr>
<td>❖ Track training program outcomes for graduation rates, attainment of industry-recognized credentials, job placement, retention, wages and wage progression</td>
</tr>
</tbody>
</table>
Endnotes


10. California Department of Resources Recycling and Recovery (CalRecycle), 12.


18 Wiggins.


21 AB 1594 (Williams, Chapter 719, Statutes of 2014) mandated a change in measurement of Daily Cover, which is the dirt or other organic material used to cover layers of landfilled material to control contamination of the surrounding environment. Alternative Daily Cover is recycled material that is used by many cities as a significant portion of their diversion goals. AB 1594 stipulated that Alternative Daily Cover will no longer count toward diversion as of 2020.
<table>
<thead>
<tr>
<th>City</th>
<th>Alternative Daily Cover used—tons 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>32</td>
</tr>
<tr>
<td>Bakersfield</td>
<td>15,096</td>
</tr>
<tr>
<td>Riverside</td>
<td>23,391</td>
</tr>
<tr>
<td>Santa Ana</td>
<td>34,049</td>
</tr>
<tr>
<td>Sacramento</td>
<td>45,818</td>
</tr>
<tr>
<td>San Francisco</td>
<td>86,350</td>
</tr>
<tr>
<td>Long Beach</td>
<td>131,553</td>
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<tr>
<td>San Jose</td>
<td>169,637</td>
</tr>
<tr>
<td>Anaheim</td>
<td>171,168</td>
</tr>
<tr>
<td>Oakland</td>
<td>249,325</td>
</tr>
</tbody>
</table>


23 California Department of Resources Recycling and Recovery (CalRecycle).


27 Chesbro.


34 California Air Resources Board, “California’s 2017 Climate Change Scoping Plan,” 68.


39 Recycled products fall into a variety of categories within manufacturing and a detailed breakdown of remanufacturing-related subsectors or occupations is beyond the scope of this report.


California Department of Resources Recycling and Recovery (CalRecycle), 6.

Chesbro, AB-1826 Solid waste: organic waste.


California Air Resources Board, “California’s 2017 Climate Change Scoping Plan,” 94.


California Air Resources Board, “Proposed Short-Lived Climate Pollutant Reduction Strategy.”


California Department of Resources Recycling and Recovery (CalRecycle), “AB 341 Report to the Legislature,” 13, 16.


58 Mike Silva, Project Engineer with CR&R, July 24, 2018, interview with author.


60 Schultz, Principal Owner of R3 Consulting Group Inc.


71 Energy Vision, “The Largest Anaerobic Digester in the United States Sets the Green Pace in Perris, California.”

72 California Department of Resources Recycling and Recovery (CalRecycle), “AB 341 Report to the Legislature.”


74 Tellus Institute, “From Waste to Jobs: What Achieving 75 Percent Recycling Means for California,” 2.

75 Chesbro, AB-1826 Solid waste: organic waste.

76 Silva, Project Engineer with CR&R.

77 U.S. Census Bureau, “County Business Patterns (CBP),” accessed October 19, 2018, https://www.census.gov/programs-surveys/cbp.html. The following NAICS codes
were combined to arrive at a total number of waste workers in the state, not including hazardous waste, remediation, or landfill workers: 562111 (Solid Waste Collection), 562119 (Other Waste Collection), 562213 (Solid Waste Combustors and Incinerators), 562219 (Other nonhazardous waste treatment and disposal), 562920 (Materials recovery facilities), 562998 (All other miscellaneous waste management services).


80 Robert Nothoff, Director of Waste and Recycling, Los Angeles Alliance for a New Economy, June 19, 2018 personal interview.

81 Recycling Today, “CalRecycle Targets Wage Violators.”


CHAPTER 9: Waste Sector


92 U.S. Department of Labor, Occupational Safety & Health Administration, “Green Job Hazards: Waste Management and Recycling.”


97 Chesbro, AB-1826 Solid waste: organic waste.


99 LA Sanitation Solid Resources Commercial Franchise Division and Solid Resources Commercial Franchise Division, “Personal Services Contract between the City of Los Angeles and Arakelian Enterprises, Inc. DBA Athens Services for Exclusive Franchise to Provide Collection, Transfer, Processing, and Disposal Services for Solid Resources to Commercial Establishments and Applicable Multifamily Establishments in the West Los Angeles, North Central and Harbor Zones” (City of Los Angeles Department of Public Works, September 15, 2016), https://www.lacitysan.org/cs/groups/public/documents/document/y250/mde0/~edisp/cnt014118.pdf.


107 Ahkiam.

