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# 2020 Recovery Rates for Plastic Waste and Food Waste

Report to the Oregon Legislature



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# Executive Summary

The Materials Management Program at the Oregon Department of Environmental Quality (DEQ) works to reduce the environmental and human health impacts of products and materials that are made and used in Oregon by promoting waste prevention, sustainable production and use of materials, and proper recovery and disposal of hazardous and other waste.

This report contains updates relating to statewide goals set by the Oregon Legislature (SB 263, 2015) for the recovery of food waste and plastic waste. The goals are 25 percent recovery of both food waste and plastic waste by the year 2020 (ORS 459A.010(2)(c)). The law directs that if the goals are not being met in 2020, DEQ shall submit a report to the interim committees of the Legislative Assembly that includes:

- (a) An evaluation of options to improve recovery; and
- (b) Recommendations for meeting or modifying these recovery goals.

The recovery of food waste is a priority because:

- The production, consumption and disposal of food and food waste leads to significant environmental impacts.
- An estimated 35 percent of all food produced or imported for consumption in the United States is never eaten, and food waste has increased significantly over time.
- The purchase of food contributes close to 15 percent of Oregon's consumption-based greenhouse gas emissions, which are the emissions produced around the world due to Oregon's consumption of energy, goods and services. Only the use of vehicles contributes more to Oregon's carbon footprint.

Plastic waste recovery is another priority for several reasons, including:

- Significant energy and environmental savings that result from making plastic items out of recycled plastic instead of virgin petroleum;
- Damage caused by floating plastic marine debris that escapes the solid waste and recycling system; and
- Other potential health and environmental impacts created by mismanaged plastic waste.

To conduct the statewide survey of recovery rates for food waste and plastic waste, DEQ surveyed most of the companies that collect or manage food waste and plastic waste from Oregon. This survey was part of the agency's annual Oregon Material Recovery Survey, which focuses on how the state manages materials at the end of their useful lives, via disposal and recovery, such as recycling or composting.

Despite ongoing efforts to improve recovery of plastic waste and food waste, Oregon did not meet either the plastic waste or food waste recovery goal in 2020. The estimated recovery rates in 2020 were:

- Plastic waste: 13.7 percent
- Food waste: 10.1 percent

This report outlines past and current efforts to recover plastic waste and food waste, and important factors influencing the 2020 recovery rates.

DEQ is in the process of planning and executing several new efforts and anticipates they will have significant impacts on the recovery of plastic waste and food waste. Such efforts include implementation of the Plastic Pollution and Recycling Modernization Act (SB 582, 2021) and development of the new strategic plan for DEQ's role in reducing and recovering food waste. Due to this current and future work, DEQ does not recommend changes to the statutory goals at this time. Future recommendations may be included in the agency's biennial report to the Legislature.

## Introduction

In 2015, the Oregon Legislature set statewide goals to recover high impact materials for recycling or other beneficial uses instead of disposing those materials in a landfill. The goals are: 25 percent recovery of food waste and plastic waste by the year 2020. The law also directs that if the goals are not met for food waste or plastic waste in 2020, DEQ shall submit a report to the interim committees of the Legislative Assembly that includes:

- (c) An evaluation of options to improve recovery; and
- (d) Recommendations for meeting or modifying these recovery goals.

Oregon did not meet either the plastics or the food waste recovery goal in 2020. The estimated recovery rates in 2020 were:

- Plastic waste: 13.7 percent
- Food waste: 10.1 percent

This report outlines past and current efforts to recover plastic waste and food waste, important factors influencing recovery rates, and options to improve recovery. The report also includes DEQ's recommendations for improving recovery and meeting or modifying the goals. The 2025 recovery goal for carpet waste will be included in a future report submitted by September 15, 2027.

## Plastic Waste

### Recovery Rate

In 2015, the Oregon Legislature established the 25 percent plastic waste recovery rate for 2020. The [Oregon Plastics Recovery Assessment](#), commissioned by DEQ, identified opportunities to increase plastics recycling in Oregon. In 2015, the recovery rate for plastic waste was close to 19 percent. The six-percentage point increase needed to meet the goal was ambitious but achievable based on historical trends and opportunities identified in the plastics recovery assessment.

To conduct the statewide survey for the plastic waste recovery rate in 2020, DEQ surveyed 167 companies that collect or manage plastic waste. This survey was part of the agency’s annual Oregon Material Recovery Survey, which focuses on how Oregon manages materials at the end of their useful lives, via disposal and recovery. The recovery rate for plastic waste represents the percentage of material recovered for useful purposes such as recycling, compared to the total amount generated. It is calculated by dividing tons of plastic waste recovered for useful purposes by the sum of plastic waste recovered plus the total amount of plastic waste disposed.

The recovery rate for plastic waste in 2020 was 13.7 percent.

**Figure 1: Percent of discarded plastic recycled in Oregon 1993-2020**

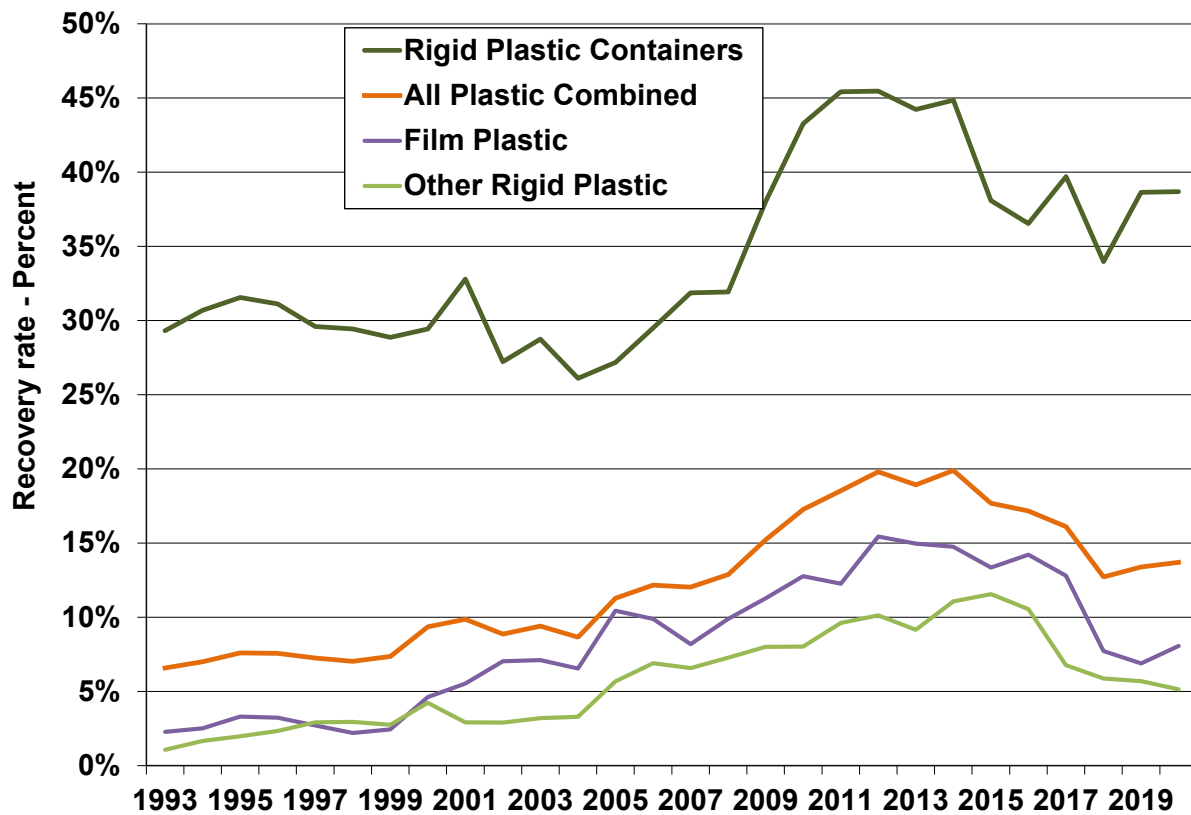


Figure 1 shows the recycling rate for all plastic waste (thick orange line) and three different types of plastic waste – rigid plastic containers, film plastic and other rigid plastic. Rigid plastic containers are collected in curbside recycling collection programs, while film plastic and other rigid plastic are not.

# Conditions Impacting Plastic Waste Recovery

Oregon's ability to meet the 25 percent plastic waste recovery goal was significantly impacted by a few key events following completion of the 2015 assessment and establishment of the goal. These conditions are explained below.

## Global recycling market disruptions

The most significant factor affecting Oregon's plastic waste recovery rate was the "National Sword" policy that China enacted in 2017. This policy imposed strong restrictions on the import of recyclable materials, including unprocessed post-consumer plastic waste. China adopted this policy due to significant amounts of unusable plastic and other trash in imported bales of material, known as "contamination." These contaminants were often mismanaged and caused environmental problems with both local and global impacts. Prior to National Sword, China had been the world's largest importer of recycled paper and plastic waste – including most of Oregon's mixed paper and plastics. Due to these historically strong international markets, Oregon and the West Coast had little infrastructure for sorting, cleaning and recycling plastic domestically. There was also little excess capacity in other recycling markets that could absorb the materials that China rejected and that were too contaminated to export.

The global restrictions disrupted recycling worldwide, and Oregon recycling programs experienced significant disruptions due to its reliance on Chinese markets. Throughout most of Oregon, except the Portland Metro area, Clatsop, and Deschutes Counties, most curbside collection programs discontinued collecting plastic tubs and pails, and some programs discontinued collecting all plastic waste. Commercial recycling programs for film plastic and other types of plastic also faltered due to market prices and lack of buyers willing to accept plastic waste at any price or cost. More information about the impacts on Oregon recycling programs is available on [DEQ's website](#).

## Bottle Bill expansion

In 2017, the refund value of containers covered by Oregon's Bottle Bill doubled from five cents to 10 cents, and in 2018, additional beverage container types were added to the deposit and redemption program, including juices, teas, kombucha and more. Due to these changes, thousands of additional tons of plastic bottles were collected and recycled. For rigid plastic containers only, these increases mostly offset the simultaneous decline in recycling collection curbside due to the global recycling markets disruptions (see Figure 1). In addition, because most of the plastics collected through the Bottle Bill are processed and recycled domestically, rigid plastic container recycling was less impacted by National Sword.

## Other factors

Figure 1 also shows a decline in plastic recycling between 2015 and 2017, prior to the international recycling markets crisis that began in late 2017. The reasons for this decline are mostly unknown to DEQ. Prices for recycled plastic were high in 2014 and then declined significantly in 2015, which would have a small effect on the recovery rate. Recycling rates for

most plastic waste collected in Oregon are typically unaffected by market prices, so this does not fully explain the decline during this period.

## **Next Steps for Plastic Waste Recovery**

Oregon's most significant opportunity to meet the plastic waste recovery goal is through the Plastic Pollution and Recycling Modernization Act (SB 582, 2021). The Oregon Legislature passed the Act in 2021 in order to update Oregon's outdated recycling system. The Act builds on local community programs and leverages the resources of producers to create an innovative system that works for everyone. The system-wide update will make recycling easier for the public to use, expand access to recycling services, upgrade the facilities that sort recyclables, and create environmental benefits while reducing social and environmental harms, such as plastic pollution. Producers and manufacturers of packaged items, paper products and food serviceware will pay for many of these necessary improvements and help ensure recycling is successful in Oregon.

Some of the provisions of this new law outline steps necessary to improve plastics recycling in Oregon and help meet the 25 percent recovery goal. Most recycling program changes will start by July 1, 2025. Below are some of the provisions of the Act that will move Oregon toward meeting its plastic waste recovery goals and will increase the environmental benefits of plastics recycling:

### **Producer responsibility for end markets**

When the Act is fully implemented, producers of printed paper, packaging and food serviceware, including plastics, will have a major role in ensuring that the materials that they produce and use will be properly managed at end-of-life. This includes financial and some operational responsibility to ensure that plastic waste and other materials collected for recycling are sold only to responsible end markets and will be recycled into new products.

### **Uniform statewide collection list**

Currently, materials collected for recycling are different in different parts of the state. Starting in July 2025, communities across Oregon will have access to recycling collection for the same list of materials. The materials that will be on this uniform statewide collection list will be considered by the Environmental Quality Commission by administrative rule in 2023.

### **Special collections**

The Act also requires producer responsibility organizations (PROs) to provide special collections for materials that are too difficult or expensive to collect through curbside recycling collection programs, but may be easily recyclable when separated. For example, this may include plastic items such as plastic bags and plastic lids. The Environmental Quality Commission will also consider rules to establish this list in 2023.



## **Expansion of recycling collection services**

The new law will expand recycling collection services to some parts of the state not currently receiving such service. Such an expansion will increase the amount of plastic waste collected for recycling. PROs will reimburse local governments for the cost of transporting plastic packaging and other covered recyclable materials from rural communities to recycling processors.

## **Recycling goals for plastic packaging and food serviceware**

The Act includes new recycling goals for plastic packaging and food serviceware (ORS 459A.926) of 25 percent by 2028, 50 percent by 2040 and 70 percent by 2050.<sup>1</sup> The law also includes an enforceable requirement that PROs adopt plans and collection programs designed to meet the 2028 and 2040 goals.

## **Accountability**

A key feature of the Act is that it creates more accountability in the recycling system, especially for plastic packaging and food serviceware. Many elements of the new system – including requirements for producers, funding to ensure plastics reach responsible end markets, new DEQ permitting and certification programs for recycling processors, and oversight from a Governor-appointed advisory council – will ensure that plastics collected for recycling are recycled into new products and create environmental benefits as intended.

## **Current Conditions and Next Steps**

Recycling markets for plastic waste continued to be very poor through 2020. However, the prices of sorted commodity plastics, such as rigid plastic containers, reached all-time highs in 2021 due to high virgin market prices for plastic, as well as strong demand from packagers and other companies for recycled plastic resin. The price for mixed-resin bales of plastic, which recycling facilities report often result from curbside recycling collection programs like those in Oregon, continues to remain very low. Some local programs that dropped collection of certain types of plastic waste have resumed their collection, while others have not.

DEQ is currently engaging with parties involved in the recycling system to develop administrative rules clarifying requirements of the Act. DEQ will then bring proposed rules to the Environmental Quality Commission for adoption in 2023 and 2024.

PROs will submit program plans by March 2024 detailing how they will implement the above requirements, and other requirements in the new law. Plans approved by DEQ will take effect on July 1, 2025. More information about the law is available on [DEQ's Plastic Pollution and Recycling Modernization Act website](#).

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<sup>1</sup> Note that the Act targets recycling of plastic packaging and food serviceware only. The statewide recovery goal targets all plastics, and may include other methods of recovery, such as energy recovery.

## **Recommendation for Plastic Waste Recovery Goal**

DEQ is not recommending changes to the plastic waste recovery goal established in ORS 459A.010. DEQ will report on additional progress toward meeting the plastic waste recovery goal in the Materials Management Program's biennial report to the Oregon Legislature. PROs will also report annually on progress toward the plastic packaging and food serviceware recycling goals, as required by ORS 459A.887.

## **Food Waste**

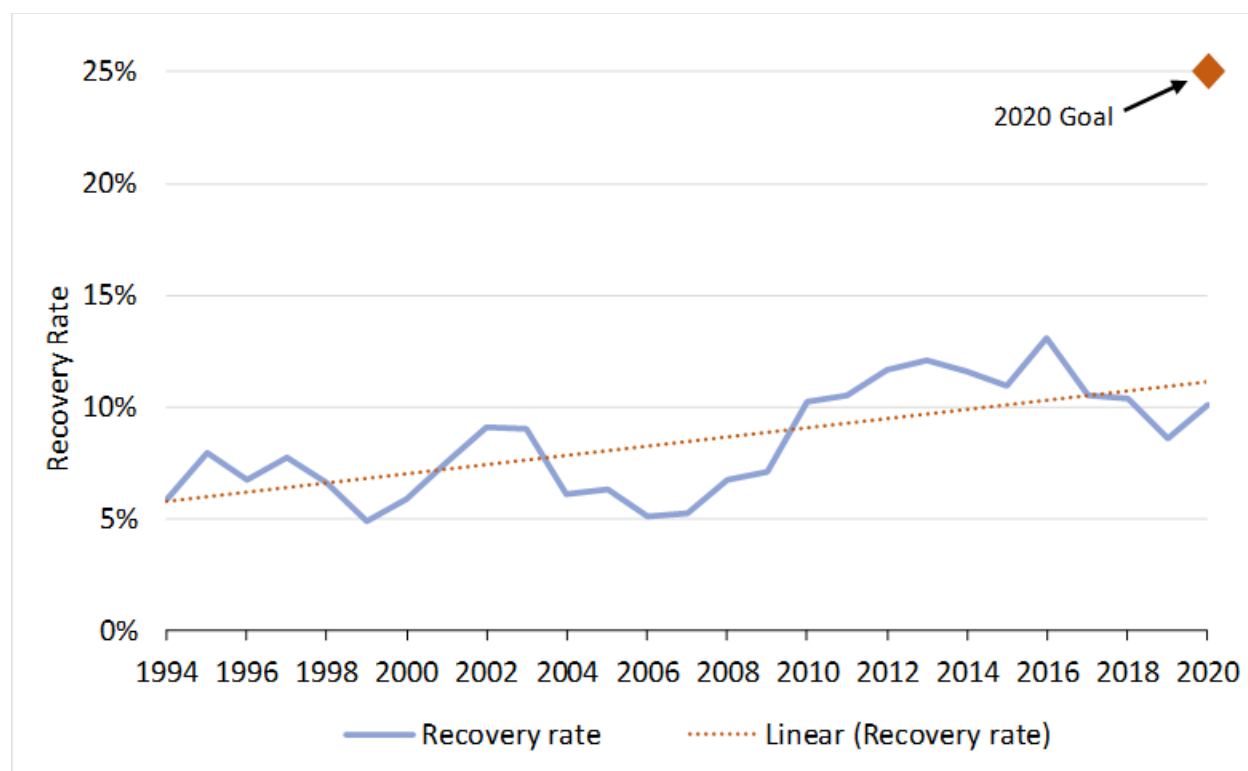
### **Recovery Rate**

In 2015, the Oregon Legislature established the 25 percent food waste recovery goal for 2020. That year, the food waste recovery rate was about 11 percent. The following year, it reached a high of just over 13 percent. Historically, Oregon's food waste recovery rate has fluctuated over time but exhibits a slight upward trend overall (see Figure 2). Between 2017 and 2019, the recovery rate declined until beginning a rebound in 2020.

To conduct the statewide survey for the food waste recovery rate in 2020, DEQ surveyed 77 companies that collect or manage food waste. As with the plastic waste survey, this survey was part of the agency's annual Oregon Material Recovery Survey, which focuses on how Oregon manages materials at the end of their useful lives, via disposal and recovery. The recovery rate for food waste represents the percentage of material recovered for useful purposes such as composting or anaerobic digestion, compared to the total amount generated. It is calculated by dividing tons of food waste recovered for useful purposes by the sum of food waste recovered plus the total amount of food waste disposed.

The recovery rate for food waste in 2020 was 10.1 percent.

Figure 2: Percent of food waste recovered in Oregon 1994-2020



The majority of recovered food waste in Oregon comes from the Portland Metro area – 78 percent in 2016 and 81 percent in 2020. The next highest amount of recovery occurred in Lane County, which recovered 5.7 percent of food waste in 2016 and 3.7 percent of food waste in 2020.

DEQ data show that Oregon recovers a higher percentage of food waste from commercial sources than residential sources. For example, according to DEQ’s 2016 material recovery survey and the 2016/2017 Oregon waste composition study, residential sources in the Portland Metro area recovered 15 percent of food waste generated – close to 92,000 tons of food waste were disposed while about 13,300 tons were collected by waste collection companies for recovery. According to the same data, 19 percent of food waste generated was recovered by commercial sources in the Portland Metro area – about 104,000 tons of food waste were disposed while about 23,700 tons were collected for recovery.<sup>2</sup>

The recovery rates tracked and reported by DEQ do not reflect food waste generated and/or recovered in Oregon that are too difficult to measure accurately or over which DEQ has no

<sup>2</sup> These figures do not include about 6,400 additional tons recovered by private companies rather than waste collection companies, much of which was likely generated by commercial sources.

authority to require reporting, such as food waste composted at home, disposed of through the kitchen sink or sent to farms for livestock feed.

Data suggests that there was a significant drop in commercial food waste collection and in the tons of food waste handled through private companies (companies not regulated by local governments) in 2020 compared to 2016. However, residential food waste collection remained about the same in 2020 compared to 2016. The reduction in material from commercial sources may be explained partly by the COVID-19 pandemic, as many restaurants either closed or moved to take-out business during much of 2020.

## **Conditions Impacting Food Waste Recovery**

There are several interrelated factors that affected Oregon’s ability to meet the food waste recovery goal, including challenges in the available collection and processing infrastructure, and a wide variety of available programs overseen by local governments across the state. These conditions, as well as other relevant considerations, are explained below.

### **Local government role and variation across programs**

One factor limiting Oregon’s recovery of food waste is that authority for planning for and collecting solid waste, including food waste, lies with cities and counties under ORS 459.065. The statute does not require localities to offer or require collection of food waste so it is not universally offered in Oregon. While a growing number of communities have food waste collection programs, many do not.

Where food waste collection programs are implemented, they vary widely in terms of which entities are covered and whether participation is voluntary or automatically included with regular solid waste and recycling collection. For existing residential collection programs, household food waste is typically collected with yard waste, although yard/food waste collection may be either rolled into overall waste collection services (known as “bundling”) or offered as a separate subscription service for an additional fee. Some jurisdictions, like City of Gresham, offer an option to households to drop off food waste at a collection site in lieu of curbside collection. Where commercial food waste collection is offered, it is often an additional subscription.

Across the state, there are more commercial food waste collection programs than residential (34 total commercial compared to 24 residential – Tables 1 and 2 list programs by county). This difference may be driven by Metro’s enactment of a mandatory commercial food scraps collection policy in 2018. Under that policy, local jurisdictions in Metro were required to adopt rules to separate and recover food scraps at commercial food service businesses. Implementation of the policy began in March 2022 for the largest generators, following a delay caused by the COVID-19 pandemic.

<b>County/Metro</b>	<b>Local Government(s)</b>
Lane County	Eugene, Springfield
Metro	Beaverton, Canby, Durham, Forest Grove, Gladstone, Gresham, Happy Valley, Hillsboro, King City, Lake Oswego, Milwaukie, Portland, Sherwood, Tigard, Tualatin, West Linn, Wilsonville, Wood Village, Unincorporated Washington County
Benton	Corvallis, Philomath
Lincoln	Newport, Lincoln City
Linn	Albany, Lebanon
Marion	Aumsville, Keizer, Salem, Silverton, Stayton, Woodburn
Polk	Dallas

<b>County/Metro</b>	<b>Local Government(s)</b>
Lane County	Eugene
Metro	Beaverton, Cornelius, Forest Grove, Hillsboro, Lake Oswego, Milwaukie, Portland, Wilsonville
Deschutes	Bend, Redmond
Hood River	Hood River
Benton	Corvallis, Philomath
Lincoln	Newport, Lincoln City
Linn	Albany, Lebanon
Marion	Aumsville, Keizer, Salem, Silverton, Stayton, Woodburn

## **Processing Capacity**

Another factor impacting food waste recovery is processing capacity statewide. Parties involved in the food waste collection system report a gap in sufficient processing capacity. Under ORS 459.045, DEQ has the authority to develop rules to regulate solid waste disposal sites, including composting facilities and anaerobic digesters. DEQ has issued permits to 11 aerobic composting facilities and one anaerobic digester to process food waste. Additionally, one anaerobic digester at a publicly owned treatment works (POTW) facility is preparing to receive food waste and several others across the state plan to receive food waste in the future. With POTWs preparing to receive food waste, waste processing capacity will increase but it is not known if this will be adequate.

## **Market Demand**

Food waste collection operators report weak market demand for compost. Weak demand is a challenge for increasing recovery of food waste because without customers to purchase the finished product, compost facilities and anaerobic digestion operators are unlikely to increase the amount of food waste they receive and process.

## Focus on Prevention

Preventing one ton of food from being wasted results in six times larger lifecycle greenhouse gas (GHG) benefits, on average, than recycling one ton of food through composting, or seven times larger benefits compared to anaerobic digestion.<sup>3</sup> For that reason, since 2016, DEQ prioritized efforts to prevent generation of food waste in the first place, relying on local governments to address recovery issues, given their authority for solid waste management. DEQ's work to promote food waste prevention is described in its [Strategic Plan for Preventing the Wasting of Food, published in March 2017](#). Work described in this strategic plan has been conducted successfully and is now largely complete.

## Next Steps for Food Waste Recovery

### Executive Order 20-04

In March 2020, Governor Kate Brown issued Executive Order 20-04, directing several state agencies to implement activities and programs to reduce greenhouse gas emissions. Among the directives for DEQ was one (paragraph 4.E) that directed DEQ to reduce food waste by half by 2030. In response to that order, DEQ conducted an analysis of food waste generation in Oregon and concluded that to meet the Governor's goal, it will be necessary to not only to significantly increase prevention, but also to significantly increase recovery of food waste. Those conclusions formed the basis for DEQ's preliminary plan to address EO 20-04, found in the [Food Reduction Waste Work Plan](#).

### Metro Commercial Food Scraps Separation Policy

As noted above, implementation of Metro's commercial food scraps separation policy began in March 2022 with the largest generators of food waste. As future phases of implementation and compliance are rolled out, more food waste will be recovered. In 2020, Metro estimated that when it is fully implemented, the new policy will more than double the amount of commercial food scraps collected per year.<sup>4</sup> Most large and medium sized food businesses must comply by March or September 2023, and small food businesses and elementary and secondary education must comply by September 2024.<sup>5</sup>

### New DEQ Strategic Plan

In 2021, DEQ began to develop a new strategic plan to shape Oregon's approach for the next five years. DEQ's strategy is to take a whole-systems, equitable approach when surveying the

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<sup>3</sup> DEQ Strategic Plan for Preventing the Wasting of Food, 2017 (<https://www.oregon.gov/deq/FilterDocs/foodstrategic.pdf>)

<sup>4</sup> Metro News (<https://www.oregonmetro.gov/news/starting-2020-many-businesses-must-keep-food-out-garbage>)

<sup>5</sup> Metro Food Scraps Separation Policy (<https://www.oregonmetro.gov/tools-working/reducing-food-waste/food-scraps-separation-policy>)

food system, and has divided future food work into three areas: sustainable production, sustainable consumption and sustainable waste management. DEQ conducted a series of initial listening sessions with food system and food waste recovery entities in the summer of 2022. Listening sessions that addressed the topics of food waste management and recovery included participants representing the state’s waste collection companies, compost facilities, operators of anaerobic digestion facilities, and local government solid waste management officials.

During DEQ’s listening sessions, participants noted that significantly increasing food waste recovery will likely require substantial effort to overcome the challenges described above, as well as others. During its strategic planning process, DEQ will further evaluate these challenges and how to address them – including lack of consistent collection programs statewide, lack of processing capacity, and lack of end markets, as well as contamination in food scraps collection. This work will culminate in development of a new strategic plan for food, which will include specific actions designed to increase food waste recovery in Oregon.

## **Compostability Study**

The Plastic Pollution and Recycling Modernization Act requires DEQ to conduct a study of the compostability of packaging and other products included in that law. The study will provide data about the impacts of contamination on compost processes and finished products and will offer recommendations for reducing environmental impacts while supporting the economic sustainability of Oregon’s compost industry. The study is due no later than December 15, 2026.

## **Recommendation for Food Waste Recovery Rate**

DEQ is not recommending changes to the food waste recovery goal established in ORS 459A.010. DEQ will report on additional progress toward meeting the food waste recovery goal in the Materials Management Program’s biennial report to the Oregon Legislature.

## **Conclusion**

Materials such as plastics and food waste play a significant role in human and planetary health. People in Oregon and around the world produce, use, consume and discard these materials and others every day. These materials have environmental impacts, as well as social and health impacts. The Materials Management Program works to reduce these impacts, using the *2050 Vision and Framework for Action* as DEQ’s guiding framework.

Although Oregon did not meet the 2020 recovery goals for food waste and plastics, the Materials Management Program will continue to work closely with our partners across these sectors and around the state to increase recovery of these and other materials. The recent recycling markets collapse, COVID-19 pandemic and other factors had significant impacts on statewide efforts to recover food waste and plastic waste. DEQ and our partners have learned new and important insights as a result of major events and conditions that affected recovery rates, which we will be taking into our future efforts to implement the Plastic Pollution and Recycling Modernization Act and DEQ’s new strategic plan to address food system impacts and

food waste. DEQ will continue reporting in the Materials Management Program's biennial report to the Legislature on these initiatives, progress toward recovery goals and other efforts to reduce the life cycle impacts materials and products produced, used and consumed in Oregon.