Materials Management Program

2023-2024 Report to the Legislature

Prepared for the Oregon Legislative Assembly

January 2025

DEQ

State of Oregon
Department of
Environmental
Quality

This document was prepared by
Oregon Department of Environmental Quality
Materials Management Program
700 NE Multnomah Street, Suite 600
Portland Oregon, 97232
Contact: Abby Boudouris
abby.boudouris@deq.oregon.gov
www.oregon.gov/deq/mm

Acknowledgements:

The production of this report was a collaborative effort supported by multiple staff within the Oregon Department of Environmental Quality.

Report authors and contributors: Katie Romano, Christa McDermott, Jenna Throckmorton, Martin Brown, Elaine Blatt, Peter Canepa, Jerin Dinkins, Rachel Harding, Lily Herd, Amanda Ingmire, Minal Mistry, Pete Pasterz, Genevieve Perdue, Nicole Portley, Daniel Redick, Cat Rhoades, Arianne Sperry, Abby Boudouris, Cheryl Grabham, Jaclyn Palermo, and Sanne Stienstra, Oregon DEQ Materials Management Program.

State of Oregon
DEQ Department of Environmental Quality

Executive Summary

The Materials Management Program at the Oregon Department of Environmental Quality reduces the environmental, social and health impacts of materials that people in Oregon make, use and discard. Materials Management is guided by the *2050 Vision and Framework for Action*, and promotes waste prevention, reuse and repair, sustainable production and use of materials, and proper management of waste. The report uses 2023 and 2024 data, unless otherwise specified.

In the past biennium, the Materials Management Program continued working and collaborating with many other partners, including local governments, community-based organizations, other state agencies, service providers, private industry, and others to reduce the impacts of materials and products throughout their full life cycle. This work involved initiatives such as: implementing necessary outreach, research, analysis and rulemaking to modernize Oregon's recycling system; updating Oregon's consumption-based emissions inventory; promoting food waste prevention and sustainable food waste management; reducing climate and health impacts in the built environment; updating the State's electronics recycling program; implementing a new mattress stewardship program; and collaborating with DEQ's Cleanup Program to redevelop and clean up closed landfills and disposal sites. The Materials Management Program also continued work in solid waste management, including permitting, inspections, investigating complaints, approving qualifying beneficial use requests and overseeing corrective actions.

Examples of the Program's accomplishments in 2023 and 2024 include:

- **Waste disposal and recovery data:** Continued analysis and reporting of waste disposal, recovery, and total generation of waste revealed a decline in recovery rates and an increase in total generation of material waste between 2022 and 2024.
- **Opportunities to reduce emissions:** Updated the state's consumption-based emissions inventory with 2021 data and identified potential new policies and programs to reduce Oregon's consumption-based emissions.
- **Community grants:** Relaunched the Materials Management grants program after a four-year pause to align funding decisions with the *2050 Vision* and better serve diverse local governments, businesses, nonprofits, schools, Tribes and communities across Oregon, with a focus on community needs.
- **Local government technical assistance:** Continued to provide technical assistance to local governments to support compliance with the Opportunity to Recycle Act and implementation of the Plastic Pollution and Recycling Modernization Act.
- **Food waste prevention:** Continued work to prevent the wasting of food and reduce environmental impacts throughout the food system, including relaunching a consumer-facing food waste prevention campaign with improved materials for local governments, schools, and Spanish-speaking communities.
- **Built environment:** Conducted research and community engagement aimed at reducing impacts of Oregon's buildings and infrastructure. Collaborated with U.S. EPA and local partners to provide resources to create more low-carbon housing.
- **Implementing the Plastic Pollution and Recycling Modernization Act:** Engaged with partners and other interested parties, gathered data and conducted robust research, coordinated two rounds of rulemaking, and worked thoroughly and steadily to meet the milestones necessary to launch the new statewide program, which will begin to roll out in July 2025.

- **Oregon E-Cycles update:** Coordinated rulemaking to clarify and implement HB 3220 (2023), which modernized and streamlined procedures of the Oregon E-Cycles program that began nearly 15 years ago. The program updates begin on Jan. 1, 2026.
- **Safe unwanted medicines disposal:** During the third program year, the two program operators offering drug take-back services under DEQ oversight reported collecting a combined total of over 98,000 pounds of unwanted medicines for disposal.
- **Cleanup of orphaned solid waste sites:** Provided removal and remediation work at 12 new and ongoing high priority solid waste disposal sites across Oregon in fiscal year 2024.
- **Permitting:** Oversaw 300 disposal site permits and 22 waste tire permits statewide in 2023 and 2024.
- **Complaints response:** Responded to 379 complaints statewide related to illegal disposal and unpermitted disposal, as well as concerns about dust, asbestos or other environmental concerns at disposal sites.

Table of Contents

Executive Summary 3

Purpose and legal context 7

Introduction: Our Vision and Framework for Action 7

Program priorities 8

Measuring outcomes 8

Consumption-based emissions 8

Material recovery and waste generation rates 10

Life Cycle Assessment and application 14

Partnership and assistance programs 15

Grants to small businesses, nonprofits, local governments, schools and Tribes 15

Cleaning up orphaned solid waste sites 17

Technical assistance to local governments 19

Reducing full life cycle impacts 20

Reducing impacts of the food system 20

Food Waste Recovery 23

Reducing impacts of the built environment 23

Advancing sustainable procurement 26

Evaluating emerging priorities 27

Producer responsibility in materials management 27

Printed paper and packaging 27

Architectural paint stewardship 29

Oregon E-Cycles 31

Oregon Drug Take-Back Program 32

Mattress recycling 33
Management of waste materials and disposal sites 34
Solid waste disposal facilities and permits 34
Short-term disposal permits and beneficial use determinations 35
Composting facilities 35
Hazardous materials management 36
Inspections and complaints response 37
Metro's waste reduction program: compliance with state requirements 38
Conclusion 38
Appendix A 39
Glossary of Terms 39
Appendix B 41

Purpose and legal context

This report informs the Oregon Legislature about the work of DEQ's Materials Management Program, with a focus on 2023 and 2024. It fulfills DEQ's requirement under ORS 459A.015 and 459A.020 to report biennially to the Oregon Legislature on Oregon's Integrated Solid Waste Management Plan, updated in 2012 as *Materials Management in Oregon: 2050 Vision and Framework for Action*. This report also fulfills DEQ's requirement under ORS 459A.340 to report on the operations of Oregon E-Cycles, the statewide system for collection, transportation, and recycling of covered electronic devices.

Introduction: Our Vision and Framework for Action

Since 2012, the Materials Management Program's work has been guided by *Materials Management in Oregon: 2050 Vision and Framework for Action*. This plan was approved by the Environmental Quality Commission, DEQ's governing body, as the state's integrated solid waste management plan, required by Oregon law.[1]

The *2050 Vision* aims high, setting a goal that "Oregonians in 2050 produce and use materials responsibly, conserving resources, protecting the environment, and living well." The *2050 Vision* considers environmental and human health impacts across the full life cycle of materials, valuing strategic choices that reduce the most significant impacts. Many impacts–such as resource depletion, pollution, and greenhouse gas emissions–stem primarily from how materials are produced, used and managed, and less from how they are disposed. DEQ estimates that 71 percent of greenhouse gas emissions associated with Oregon's consumption of goods and services in 2021 occurred before the point of purchase.[2]

In 2023-24, DEQ made progress towards the *2050 Vision* goals by implementing policies and programs to: reduce impacts from the built environment, create a more sustainable food system and reduce food waste, support community-led materials management initiatives, conduct cutting edge research, identify opportunities to reduce the climate impacts of materials, collaborate with community across various sectors, and safely and responsibly manage waste disposal and recycling. Notably, DEQ made significant progress implementing landmark

[1] Details of this law can be found in ORS 459A.020.

[2] Oregon DEQ, *Opportunities to Reduce Greenhouse Gas Emissions Caused by Oregon's Consumption* (2024)

legislation that expands the responsibility of producers through the Plastic Pollution and Recycling Modernization Act (Senate Bill 582, 2021).

A glossary of terms is available in Appendix A.

Program priorities

Using the core tenets of sustainable materials management and applying life cycle thinking, the Materials Management Program works toward several priorities critical to achieving the *2050 Vision*. These priorities, identified in the *2020 Framework for Action*, include a focus on materials that have significant environmental and health impacts, such as air pollutants, toxics, and major contributors to greenhouse gas emissions; engagement with existing and new partners and collaborators; and emerging issues.

Measuring outcomes

Consumption-based emissions

Through HB 3409 (2023), the Oregon Legislature directed DEQ to evaluate opportunities to reduce Oregon's consumption-based emissions. The Materials Management Program updated the State's consumption-based emissions inventory and subsequently worked with a contractor to create projections of Oregon's consumption-based emissions until 2050, with and without new consumption-informed policies. The *Opportunities to Reduce Greenhouse Gas Emissions Caused by Oregon's Consumption* report, published in September 2024, details these projections and potential policies.

Most statewide studies of emissions are sector-based, which means they only count emissions created within the state such as tailpipe emissions from cars or emissions from factories. However, to understand the total emissions residents and businesses in Oregon create, it is necessary to broaden the perspective to also include consumption-based emissions. The consumption-based emissions inventory calculates the global emissions associated with purchasing materials and services in Oregon, regardless of where these emissions occur. The consumption-based inventory quantifies the worldwide emissions people and businesses in Oregon are responsible for, through their purchases of goods and services. This approach aligns with the State's commitment to addressing climate change holistically by recognizing the interconnected nature of local consumption and global emissions. Through this lens, Oregon can develop strategies that not only lower emissions locally but also contribute to broader climate solutions.

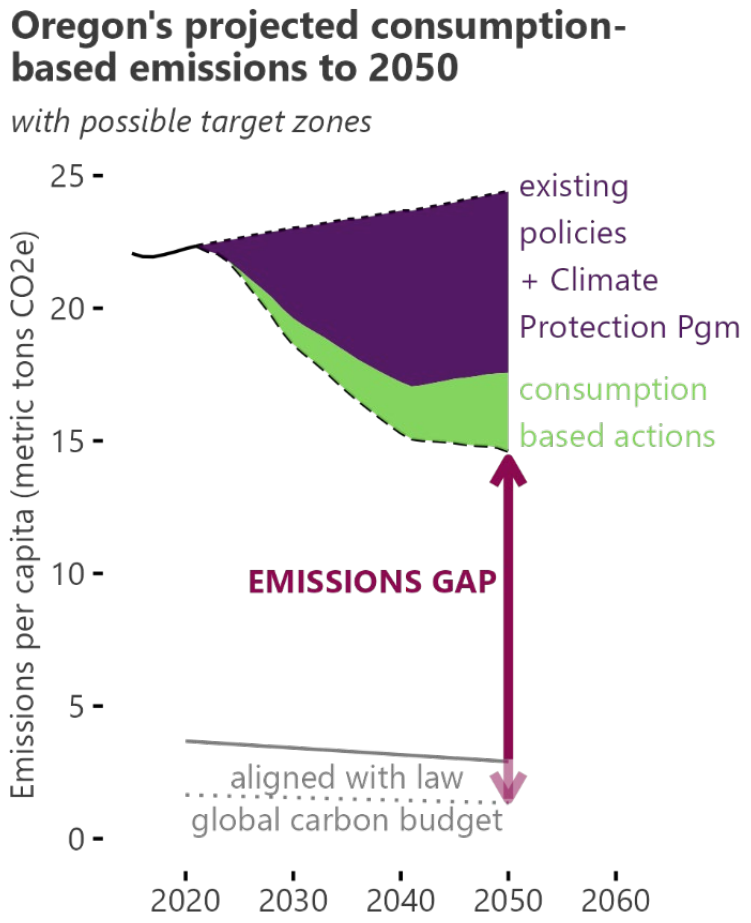

Figure 1. *Oregon's projected consumption-based emissions to 2050,* Wedge analysis illustrates potential emissions per capita reduction.

Oregon's consumption-based emissions have been rising rapidly. Even as emissions within Oregon have declined, the state's overall contribution to climate change is increasing. However, the report also identifies many new opportunities to reduce emissions beyond current policy and programs (Figure 1). Among the most promising are actions related to buildings and infrastructure, food, product stewardship and "smart growth." The report illustrates how including these new policies in Oregon's response to climate change offers potential to further reduce our state's carbon footprint in a robust and cost-effective manner, while also generating added economic, social and environmental co-benefits.

Material recovery and waste generation rates

In 2015, the Legislature set goals to reduce waste generation and increase the recovery of materials at the end of their useful life. To create numerical goals, 2012 became a benchmark year for waste generation and goals for future waste generation amounts are created by reducing the benchmark number by a particular percentage. These goals, among others set at county and municipal levels, encourage people across the state to engage in local and statewide efforts to reduce waste and recover materials through various programs and annual events. These goals include:

- **Waste generation goals:**
  - From 2025 through 2049, the total amount of waste generated (disposal plus recovery) in Oregon shall be 15 percent below the total generation of solid waste in 2012.
  - In 2050 and beyond, the total amount of solid waste generated in Oregon shall be 40 percent below the total solid waste generated in calendar year 2012.
- **Material recovery goals:**
  - From 2020 through 2024, the rate of material recovery from the general solid waste stream shall be at least 52 percent, and in 2025 and subsequent years it shall be at least 55 percent.

Waste generation goals

In 2012, the total tons of solid waste generated was 4.8 million tons. To achieve the goal of reducing waste generation by 15 percent, that number should be 4.1 million tons or less. As indicated in Figure 2, Oregon has not yet achieved that goal. From 2010 through 2021, waste generation increased. Many factors impact overall waste generation. For example, devastating wildfires in late 2020 destroyed many buildings and vehicles and contributed to a notable waste generation in 2021. Without the excessive fire debris disposed in 2021, the waste generated in 2021 would have been about the same as or a little less than the waste generated in 2022. As noted in the *Oregon Material Recovery and Waste Generation Rates Report*, waste generation fell from close to 6.5 million tons in 2021 to just under 6.1 million tons in 2022, which is the most recent year for which DEQ has calculated generation and recovery rates. The increase in recovery appears closely correlated with the improved Oregon economy since the recession of 2007-2009.

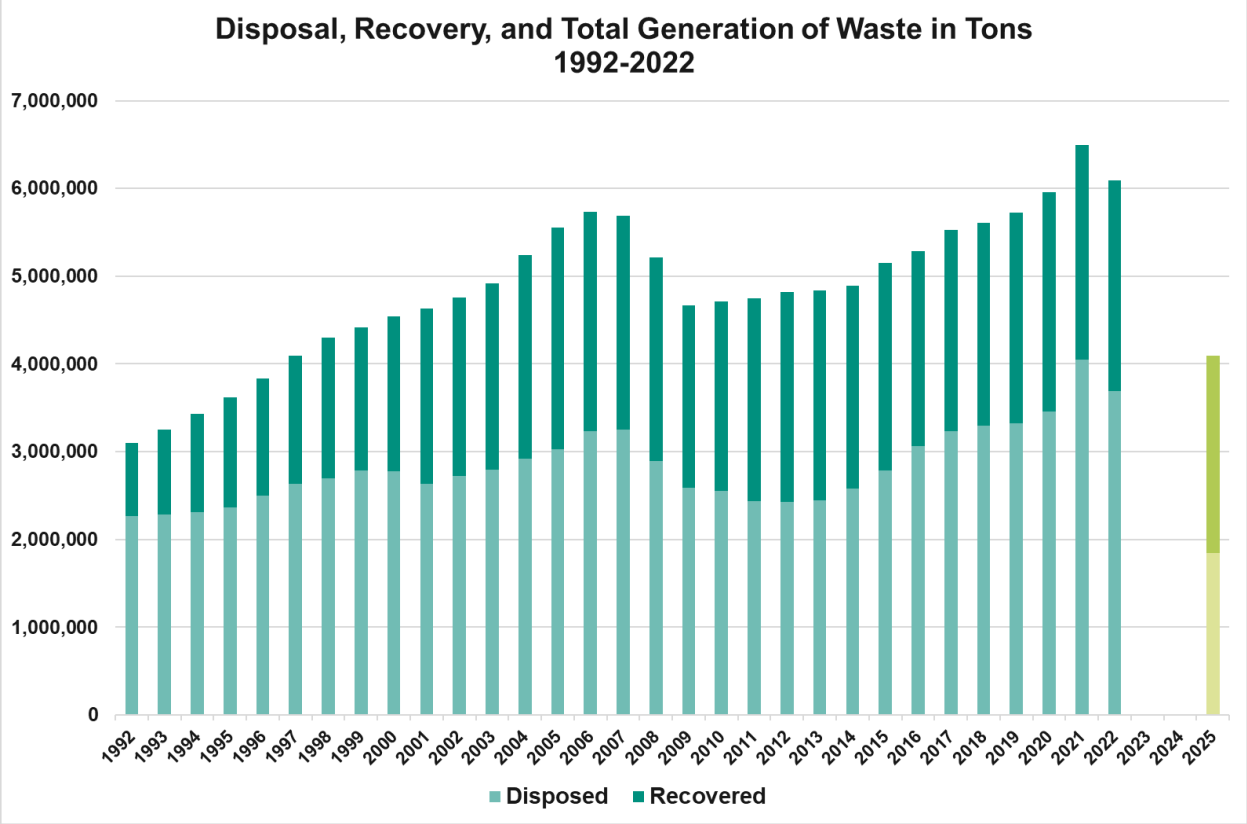

Figure 2. *Disposal, Recovery, and Total Generation of Waste in Tons, 1992-2022,* This graph shows waste generation, in tons, from 1992 through 2022. The bar for 2025, differentiated in green, shows the combined 2025 goals for waste generation (85 percent of waste generation in 2012) and recovery (55 percent of total waste generated that year).

Material recovery goals

The trend for the recovery rate of materials is similar to the waste generation rate. For many years, the recovery rate of materials in Oregon increased, from 27.1 percent in 1992 (the first year DEQ measured recovery rates) to a high of 49.5 percent in 2012. However, recovery rates dropped sharply in the next few years, leveling off at about 42 percent through 2020. The recovery rate dropped to under 38 percent in 2021, mainly due to the large amount of fire debris from the fires in late 2020. The recovery rate remained under 40 percent in 2022, indicating that the recovery rate still is slowly declining (see Appendix B). Recovery rate is calculated both at a statewide level and by individual wastesheds, as seen in Figure 3. Oregon has 35 individual wastesheds, each with its own recovery rate and goal. Based on goals established by SB 263 (2015), seven wastesheds are already at or above their goal for 2025.

Oregon Amount Disposed and Recovered by Wasteshed, 2022

Wasteshed	2022 Disposed (tons)	Per Capita (lbs.)	2022 Recovered (tons)	Per Capita (lbs.)	2022 Calculated Recovery Rate
Baker	14,071	1,641	3,187	372	18.5%
Benton	71,811	1,663	32,968	763	31.5%
Clatsop	41,703	1,987	20,091	957	32.5%
Columbia	32,798	1,234	9,341	351	22.2%
Coos	58,991	1,812	18,082	555	23.5%
Crook	27,786	2,124	11,311	865	28.9%
Curry	22,099	1,850	5,936	497	21.2%
Deschutes	225,929	2,177	84,413	813	27.2%
Douglas	103,451	1,852	25,416	455	19.7%
Gilliam	2,920	2,819	763	737	20.7%
Grant	4,699	1,281	979	267	17.2%
Harney	4,884	1,279	1,010	264	17.1%
Hood River	25,932	2,171	9,033	756	25.8%
Jackson	229,268	2,047	111,201	993	32.7%
Jefferson	20,838	1,641	6,625	522	24.1%
Josephine	85,396	1,926	34,187	771	28.6%
Klamath	75,473	2,131	20,071	567	21.0%
Lake	5,807	1,408	630	153	9.8%
Lane	284,399	1,481	319,447	1,664	52.9%
Lincoln	45,509	1,782	20,328	796	30.9%
Linn	108,287	1,540	85,953	1,222	44.3%
Malheur	24,852	1,549	6,641	414	21.1%
Marion	333,431	1,914	291,952	1,676	46.7%[2]
Metro	1,457,079	1,575	1,139,010	1,231	43.9%
Milton-Freewater	5,395	1,342	1,276	318	19.1%
Morrow	23,152	3,760	4,922	799	17.5%
Polk	55,725	1,243	34,935	779	38.5%
Sherman	1,298	1,339	396	409	23.4%
Tillamook	32,496	2,332	12,238	878	27.4%
Umatilla	96,225	2,660	24,806	686	20.5%
Union	20,956	1,571	7,864	590	27.3%
Wallowa	5,093	1,351	1,683	446	24.8%
Wasco	22,401	1,672	6,924	517	23.6%
Wheeler	461	642	88	122	16.0%
Yamhill	120,329	2,190	47,100	857	28.1%
Oregon Totals	**3,690,946**	**1,724**	**2,400,810**	**1,121**	**39.4%**

Figure 3. *Oregon Amount Disposed and Recovered by Wasteshed, 2022*. The amount of waste disposed or recovered and the corresponding calculated recovery rate for each wasteshed in the state of Oregon. A wasteshed is an area of the state that shares a common solid waste disposal system, or an appropriate area in which to develop a common recycling system. Typically, individual Oregon counties are designated as wastesheds.

Waste and Recycling Composition Studies

DEQ completed field work and preliminary analysis for three separate but interrelated waste and recycling composition studies in 2023-2024:

- **Disposed waste composition**, as required by ORS 459A.035.
- **Composition of collected commingled recyclables:** This study was designed to determine current contamination levels of commingled recyclables collected throughout the state, and how much of the commingled material is a covered product under the uniform statewide collection list as established by the Recycling Modernization Act.
- **Composition of materials and wastes after sorting at commingled recycling processing facilities:** When commingled materials are processed in a recycling facility, they are sorted by weight and material type then bundled into bales with like materials. Sometimes in this sorting and bundling process, materials get sorted into the wrong commodity stream (such as plastic bottles ending up in paper bales) thus causing contamination when the bales are sold by the commingled processing facilities. This study was designed to gather data on current contamination levels of different materials marketed by commingled recycling processing facilities. It also determined the capture rate of each material–the percentage of material that gets sorted into the proper commodity stream as opposed to the wrong commodity or disposed residue. DEQ has conducted this type of study once before, in 2009-2010.

Results reported here are based on preliminary data analysis and may be subject to small adjustments on completion of the report in 2025.

Key results of these studies include:

- **Contamination of commingled recycling set out by households and businesses has increased sharply in recent years.** Contamination is considered to be any item that doesn't belong in the recycling bin. Studies of commingled recycling in roll carts from 2004 through 2014 showed average contamination levels of 9-10 percent. In 2023, the average contamination rate was 15.6 percent.
- **The main outbound commodity streams from commingled recycling processing facilities are also significantly more contaminated.** Under the Recycling Modernization Act, all outbound commodities produced by commingled recycling processing facilities shall not exceed 5 percent, a standard adopted by rule by the Environmental Quality Commission in 2023. At the time of this rule adoption, none of the six full-line commingled recycling processors where samples were collected met that standard, with the average outbound contamination at more than 14 percent.
- **The capture rate of materials properly set out for recycling has also declined significantly on average since 2009.** Capture rate measures how much of a material

entering the facility ends up in the proper outgoing commodity stream. The capture rates for paper are high, at close to 95 percent. However, the capture rate for plastic and metal containers are much lower, both under 65 percent. This means that of the appropriate plastic and metal containers properly set out by households and businesses for recycling, more than one-third end up improperly sorted–mostly ending up in paper bales, with some also being disposed.

- **The total recovered tons decreased nearly 44,000 tons in 2022 when compared to 2021.** Materials showing the biggest increases in recovery were scrap metal (+63,645 tons) and tires (+6,985 tons). While organics (-68,569 tons) and cardboard (-18,726 tons) recovery decreased. Lead acid batteries showed a decrease of 5,593 tons and plastics saw a decrease of 5,000 tons when compared to 2021.

In summary, a variety of factors has led to a reduction in Oregon's recovery rate and waste generation rates, contrary to the goals set by the Oregon Legislature in 2015. Additionally, the global recycling markets disruption in 2018 made us all aware that our recycling has led to environmental and health problems in areas of the world that do not have highly regulated systems for the management of wastes. Passage of the Recycling Modernization Act in 2021 and its prompt implementation in 2025 will support the improvement of recovery rates by:

- implementing programs to reduce contamination and provide more opportunities to recycle materials,
- setting standards that will reduce contaminants in commodities sold to end-users of materials,
- requiring processors to meet goals that ensure materials in the recycling stream make it to end-users that can use that material, and
- requiring that the commodities produced are sold only to responsible end markets that can properly manage any contamination.

Recovery presents an opportunity for environmental impact reductions, but only a limited one. To achieve deeper reductions in the environmental impacts of materials and waste, DEQ and its partners will need to take actions across the entire materials life cycle, such as redesigning products and reducing overall materials use.

Life Cycle Assessment and application

The *2050 Vision* directs DEQ's Materials Management Program to minimize the environmental impacts linked to Oregon's use of materials across their life cycle. To determine the environmental impacts associated with materials, the Program employs a scientific method called Life Cycle Assessment, which systematically quantifies the environmental burdens associated with the production, use, and disposal of these materials.

Uses of LCA

Since the *2050 Vision* was adopted in 2012, the Materials Management Program has applied LCA to various materials and policies including: the built environment, food systems, electronics, packaging, reuse/repair, waste recovery and disposal. Across each of these work areas, LCA is used to estimate the environmental outcomes of different policy choices, to provide direction on how and where to best minimize the environmental impacts.

Most recently, LCA has supported the implementation of the Recycling Modernization Act by calculating potential environmental outcomes associated with different materials and their end-of-life dispositions, including recycling, incineration, or landfilling. These outcomes were used to determine the inclusion of specific materials on the universal statewide acceptance list for recycling, which will go into effect in 2025. Administrative rules outlining the methods for life cycle evaluation of covered products under the Act by producers of these products were adopted by the Environmental Quality Commission in 2024. These methods, required by ORS 459A.944, will provide a consistent and robust scientific framework for the evaluation and disclosure of the environmental impacts of covered products under the Recycling Modernization Act. The results of LCAs conducted using these rules will support ecomodulation of fees producers must pay into the system, rewarding those products that minimize environmental impacts.

Partnership and assistance programs

Grants to small businesses, nonprofits, local governments, schools and Tribes

After a four-year pause, Materials Management relaunched its grants program in May 2024 to better align the program with the *2050 Vision for Materials Management* and the *2020 Framework for Action*. The purpose of the updated program is to support statewide efforts to reduce the environmental and human health impacts of materials at all stages of their life cycle.

With a refreshed name, purpose, goals, and objectives, the Reduce, Reuse, Reimagine Grants Program encourages creativity from applicants looking to center community needs and conduct environmentally focused work in their regions (Figure 4).

Figure 4. *Reduce, Reuse, Reimagine,* Updated design and name for the Materials Management grants program

For the 2024 solicitation period, the annual funding area was Waste Prevention. The grants program received 110 pre-applications totaling over $10 million in funding requests. A panel of DEQ subject matter experts participated in a review and panel discussion of all pre-applications. From the group of pre-applications, 39 applications were invited to submit full project proposals. After another round of reviews and panel discussion, the program awarded 14 applications, totaling $1.2 million in funding.

Below are some of the recipients for the 2024 Waste Prevention cycle:

- Klamath Works Reuse Project – Klamath Works in Klamath Falls was awarded $125,000 to design updates to the community's construction and general household materials thrift store. Updates include improvements to the receiving, sorting, and repairing areas, as well as the construction of a workspace for community member use.
- New Beginnings Market – The Immigrant and Refugee Community Organization in Portland was awarded $125,000 to support the collection and distribution of furniture, household goods, and personal care items to recent immigrants to the Portland Metro area.
- Confederated Tribes of Grand Ronde Waste Reduction Initiative – The Confederated Tribes of the Grand Ronde was awarded $40,000 to purchase reusable dishware and kitchenware for a child development center. The grant will also fund the purchase of two laser engravers to make updates to label designs and phase out plastic product labels.

Figure 5. *Photo collage showcasing six of the fourteen 2024 grant recipients,* Images feature staff and community members engaging in waste prevention activities ranging from reusable dishware at events to utilizing tools acquired from a local tool library.

In 2026, the Reduce, Reuse, Reimagine Grants Program will open the next solicitation period with a new annual funding area and a $1 million budget.

Cleaning up orphaned solid waste sites

The Solid Waste Orphan Site Account is funded through a $0.13 per ton fee on all domestic solid waste generated in Oregon. Since 1993 this fund has been used to investigate and clean up known or suspected hazardous substance releases from municipal landfills, private landfills,

and illegal solid waste disposal sites that meet funding criteria specified in OAR 340-122-0510 through 0590.

In fiscal year 2024, SWOSA spent $2,609,040. In fiscal year 2025 SWOSA will propose three additional projects. These sites include municipal and private landfills, illegal auto and metal scrap yards, a clandestine drug lab, and other illegal dump sites. Throughout the course of a project, the SWOSA program typically works closely with local governments to coordinate funding, labor, property access, or reduction of waste management fees.

Figure 6. *Former landfill in Coos Bay,* This former landfill in Coos Bay received landfill cap enhancements to address concerns of leachate runoff and elevated metal concentrations in the area.

Figure 7. *Side by side comparison of SWOSA cleanup site*, Before (left) and after (right) extensive solid waste removal at an illegal auto salvage site near Newport. The county is now exploring the option of establishing a conservation easement at the site.

Recent projects have removed and transferred tons of illegally disposed solid waste to appropriate disposal sites, assessed and mitigated release or threat of release of hazardous substances to the environment, and protected critical fish and wildlife habitat. Ultimately, SWOSA's cleanup actions and abatement of threats to human health and the environment support the redevelopment of sites, improve the long-term safety of landfills, return properties to productive use, increase local property values and tax revenue, and provide the foundation for new community assets such as parks. To help guide SWOSA's limited funding toward the highest-impact sites in the future, DEQ has begun to develop a public process for improved outreach and project selection that will build community involvement and prioritize underrepresented communities.

Technical assistance to local governments

The Opportunity to Recycle Act (1983) and the Oregon Recycling Act (1991) established solid waste management policies that recognize the environmental benefits of waste prevention, reuse, and recycling. In 2015, the Oregon Legislature passed SB 263 which better enables DEQ, local governments, and Oregonians to make progress under the *2050 Vision*. These laws place certain recycling requirements on local governments in Oregon. To assist communities across the state, DEQ has six full-time regional specialists who support local governments navigating these requirements and ensure that the recycling programs in their jurisdictions comply with these laws.

Oregon has 36 counties and 91 cities that DEQ surveys through an annual Opportunity to Recycle report to determine compliance with recycling laws. Regional specialists work directly

with local governments to find solutions on implementation issues and ensure that the opportunity to recycle is being offered to the public.

The Plastic Pollution and Recycling Modernization Act (2022) builds upon existing requirements contained in Oregon's Opportunity to Recycle and Recycling Acts. With the new law comes changes to the recycling requirements, effective July 1, 2025, that will impact local government recycling programs. DEQ's regional staff are providing targeted outreach and educational materials related to these changes, including email communications, fact sheets, and videos to assist local governments in their public education efforts.

Reducing full life cycle impacts

Reducing impacts of the food system

An estimated 38 percent of food produced or imported for consumption in the United States goes uneaten, contributing to greenhouse gas emissions at all stages in the food supply chain.[3] In Oregon, both the *2050 Vision* and the Oregon Climate Action Commission's *Oregon Climate Action Roadmap to 2030* have highlighted the need for a comprehensive, life cycle view of food systems. This approach focuses not only the environmental impacts of food waste but also the broader effects of producing, distributing, preparing, consuming, and disposing of food across the entire system.

2024 Strategic Plan

DEQ developed a new strategic plan for food systems in 2024 after over two years of work with partners across Oregon to map the state's food system. This plan is broader in scope and takes a more complete view of food systems than DEQ's previous *Strategic Plan for Preventing the Wasting of Food* (2017). The new plan outlines DEQ's policy priorities for a more sustainable food system in three key areas–production, consumption and waste management. It highlights DEQ's commitment to reducing the environmental impacts of food through preventing food waste at the source, encouraging consumption of lower impact foods, and managing unavoidable food waste to recover its remaining value for use in lower impact food production. A more detailed Action Plan will accompany the Strategic Plan in 2025.

Food Waste Prevention

Consumer education campaign: DEQ continued food waste prevention work through the Bad Apple campaign, which originally launched in October 2021. The campaign, based on research identifying effective messaging to motivate consumers, emphasizes the financial savings of reducing food waste and offers practical tips to prevent food spoilage. The U.S. EPA recognized

[3] ReFed, Insight Engine; accessed Jan.3, 2024.

the campaign's impact, awarding DEQ a $410,000 Solid Waste Infrastructure and Recycling grant in 2023 to expand and promote these materials into the next biennium. DEQ relaunched the campaign at the end of the 2024 with improved materials for local governments, schools, and Spanish-speaking communities, as shown in Figure 8.

Figure 8. *Example of Bad Apple campaign advertisement,* DEQ staff worked with local governments, community organizations, and a contractor to develop new characters for the award-winning Bad Apple campaign, including a potato and a red pepper that can provide messaging in Spanish.

National awareness week: DEQ expanded Oregon's participation in the national Food Waste Prevention Week campaign by growing and supporting a strong network of local Oregon partners and contributing to the national campaign. DEQ introduced new programs to engage diverse audiences including a food waste video contest for students and an Oregon Food Waste Collective webinar series. Each year during Food Waste Prevention Week, over 10 events are hosted across Oregon. The next Food Waste Prevention Week will be held April 7-13, 2025.

Figure 9. *Food Waste Prevention Week 2024,* Various images from activities and events during Food Waste Prevention Week 2024.

Outreach for underserved communities: DEQ co-led a collaborative project with the Natural Resources Defense Council, City of Portland, and Washington County to improve food waste prevention outreach for underserved communities. The project partnered with two community-based organizations, Trash for Peace and Centro Cultural, to engage low-income, Spanish-speaking individuals living in multi-family housing in discussions about food waste. The goal was to better understand why food is wasted within these communities and the results will be used to inform development of behavior change interventions to reduce household food waste. The project resulted in feedback that was integrated into community engagement, education, and outreach materials within the Portland metro area and throughout the state.

Commercial food waste pact: DEQ continued a leadership role with the Pacific Coast Food Waste Commitment, a voluntary initiative aimed at cutting food waste in half by 2030. Since 2019, the PCFWC has engaged food enterprises across the supply chain, including grocery retailers, food manufacturers, processors, food service businesses, and distributors. The program has successfully implemented strategies to reduce wasted food. Since 2019, reporting retailers demonstrated unsold food rates decreased by 28 percent; per capita unsold food decreased by 24 percent; and the estimated carbon footprint of unsold food dropped by 30 percent. Additionally, food donation rates increased by 20 percent. The PCFWC's Whole Chain Project engaged participants across the supply chain of specific high loss foods, such as strawberries and frozen potatoes, to focus attention on environmental "hotspots."

Food waste recovery

As a result of its work to map food systems (described above) and the significant impacts of food waste disposal, the Materials Management Program has deepened its engagement in food waste recovery. In the past biennium, the Program conducted foundational work to better understand existing food waste recovery programs, including studying key issues, such as contamination, that can promote and enhance food waste recovery; mapping compost and anaerobic digestion facilities across the state; identifying gaps in food waste processing; and hiring a new position focused on food waste recovery.

In July 2024, U.S. EPA awarded the State of Oregon's Climate Pollution Reduction Grant application for $197 million to support 12 measures to reduce greenhouse gas emissions, including food waste recovery. Through CPRG implementation, the Program will use the $30 million awarded to improve food waste recovery and processing infrastructure statewide. This funding will:

- Increase the capacity to process food waste at new and existing composting sites; and
- Support several community-based composting initiatives to either scale existing composting operations or develop new composting programs aimed at increasing access to fresh food in underserved areas.

Reducing impacts of the built environment

The built environment overall is one of the most significant contributors to the state's consumption-based emissions–28.7 percent, with building materials accounting for approximately half of these emissions (14.4 percent). This means that the greatest reduction opportunity to reduce Oregon's consumption-based emissions is to reduce the embodied carbon of building materials. Embodied carbon refers to the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building and infrastructure materials.

Additionally, the built environment makes up nearly one-third of Oregon's waste stream; affects human health through exposure to toxics in materials, proximity to industrial manufacturing, indoor environmental quality, vulnerability during natural disasters; and continues to play a role in exacerbating environmental injustices, labor rights violations, and economic disparities.

Addressing embodied carbon in building codes and other means

In 2024, the Program supported the Department of Consumer and Business Services to study the options for, and feasibility of, reducing greenhouse gas emissions that result from materials used in building construction, including the use of lower carbon materials in the statewide building code or applicable specialty code or other means. The Program provided technical support, review, and background data from Oregon's consumption-based emissions inventory to DCBS. DCBS's report, *Options to Reduce Greenhouse Gas Emissions Attributable to Building Materials*, identifies several opportunities to reduce embodied carbon in building codes and

other means. The report was required by Section 7 of House Bill 3409, the climate omnibus bill of 2023, and was submitted by DCBS to the Legislature by Dec. 31, 2024.

Listening sessions and community demonstration projects

One of the priority work areas identified in DEQ's first Strategic Plan for the Built Environment was to conduct a listening tour around the state. In fall 2023, DEQ conducted a three-part series of listening sessions with six community groups. The goals of the engagements were to connect with people about their built environment experiences, needs and priorities, and to build relationships and trust. A key finding was all six community groups shared these priorities: access to affordable housing, workforce development, and livable wage opportunities.[4] The Program continues to engage and collaborate with some of the community groups on demonstration projects to address these priority areas.

Figure 10. *Built Environment Listening Sessions,* Images from Nehalem, Ontario, Hood River, and Portland, four of the six community groups that participated in the statewide listening sessions.

Climate Pollution Reduction Grants for Low-Carbon Housing

Oregon is in a housing crisis, and Governor Kotek has deemed statewide housing production a top priority. At the same time, emissions associated with the building and construction materials

[4] For more information about the project's approach, methods, and findings, see full Built Environment Listening Sessions Engagement Summary Report (2023).

we use, commonly referred to as embodied carbon, contribute significantly to Oregon's consumption-based emissions.

In July 2024, U.S. EPA awarded the State of Oregon's Climate Pollution Reduction Grant application for $197 million to support 12 measures to reduce greenhouse gas emissions, including low-carbon housing. Through CPRG implementation, the Program will fund enhanced utilization of existing buildings, smaller new construction of homes, and reducing embodied carbon of construction materials. DEQ will work with nine local government partners around the state to issue approximately $25.6 million in funds to incentivize 940 low-embodied carbon housing units through two strategies:

1. 210 units through adaptive reuse of existing buildings, and
2. 730 space-efficient units.

The local government partners include Eugene, Bend, Hood River, Tillamook County, Portland, Reedsport, Medford, Ontario, and Pendelton.

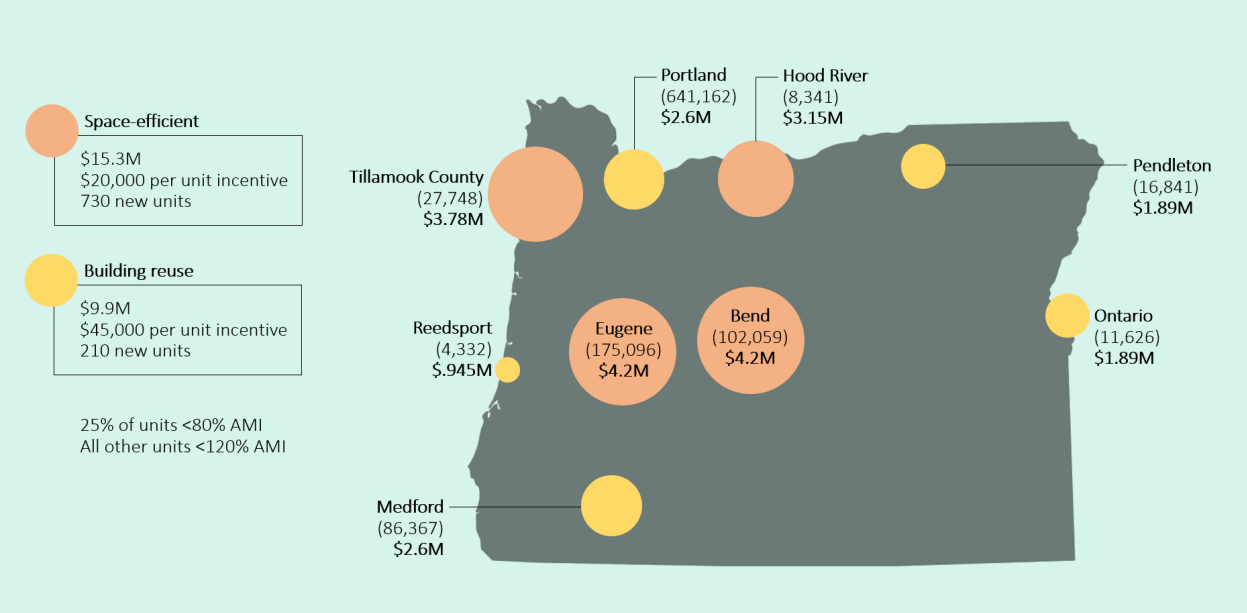

Figure 11. *Distribution of Partners Implementing CPRG Funding,* A visual representation of the nine local government partners in Oregon and the funding going to each jurisdiction to incentivize low-embodied carbon housing units through adaptive reuse of existing buildings and space-efficient housing units.

Pacific Coast Collaborative Low Carbon Construction Task Force

The Program participates in the Pacific Coast Collaborative's Low Carbon Construction Task Force, which is a coordinated regional initiative to advance low-carbon materials and methods in building and construction projects. In 2023, leading designers, engineers, contractors, product manufacturers, non-profits, and governments addressing embodied carbon developed the Task Force's shared regional strategy. This strategy is intended to accelerate innovation, investment,

and market development for low-carbon materials by leveraging the scale of the Pacific Coast regional economy. The Materials Management Program will be an active member in implementing key actions in the strategy.

Buy Clean Oregon

Buy Clean Oregon, established through HB 4139 (2022), requires the Oregon Department of Transportation to establish a program to reduce greenhouse gas emissions that assesses greenhouse gas emissions attributable to concrete, asphalt, and steel that the department uses in construction and maintenance activities for state's transportation system. DEQ has and continues to support ODOT by serving on its Technical Advisory Committee supporting implementation of the law.

Advancing sustainable procurement

DEQ partners with the Department of Administrative Services (DAS) and other agencies in Oregon and across the nation to promote sustainable procurement. Sustainable procurement policies incorporate criteria related to environmental, social and economic sustainability into government purchases.

In 2023-2024, DEQ continued collaboration with DAS to develop the Sustainable Procurement Program through research, technical assistance, and strategic program development. DEQ assistance included green chemistry, statewide price agreements, and developing training materials. Notably, this resulted in an update of the state’s green chemistry procurement policy, which was the first update in 10 years.

Figure 12. *Collage of flooring materials and fire fighting materials,* DEQ assisted DAS to incorporate sustainability considerations into statewide price agreements for carpet, flooring, and fire fighting materials, among other purchases.

DEQ's September 2024 report to the legislature, *Opportunities to Reduce Greenhouse Gas Emissions Cause by Oregon's Consumption*, identified public contracting and purchasing policies as an important strategy DEQ will continue to pursue.

Evaluating emerging priorities

The Materials Management Program uses a life cycle approach to identify points of intervention to reduce the impact of goods and services consumed in Oregon. The life cycle approach offers insight into macro materials, such as metals, glass, plastics; products such as electronics and packaging; and services such as auto repair and construction.

Microplastics and chemicals associated with materials

There are several emerging priorities DEQ is evaluating in the broad category of microplastics and chemicals associated with materials. Microplastics have been documented in human organs and tissue, food, and drinking water. They are found in all ecological zones on the planet. Traditional solid waste management strategies offer limited opportunities to prevent, remediate, or clean up micro scale plastic particles and fibers. DEQ is using a systems approach to better evaluate these emerging priorities.

The Program is collaborating with regional universities and researchers to expand understanding and identify potential interventions, including policy instruments. There are several regional studies underway to assess microplastic flows from urban, rural, and coastal regions into waterways and out to the Pacific Ocean. Studies include wastewater treatment, household and commercial clothing washing and drying, plastics on the farm and salmon stream assessments. A collaborative effort between DEQ and Oregon State University's Hatfield Marine Laboratory is assessing field samples from Oregon's solid waste system to: 1) characterize the types of plastics found in different media (wastewater, soil, air); 2) identify the shape and size of materials by waste treatment route (composting, recycling etc.); and 3) the prevalence of plastics by treatment route.

Producer responsibility in materials management

Printed paper and packaging

In 2021, the Oregon Legislature adopted Senate Bill 582, the Oregon Plastic Pollution and Recycling Modernization Act. This innovative law builds upon existing local recycling programs while leveraging the resources of producers to expand access to recycling services, upgrade the facilities that sort recyclables, create a new statewide list of accepted recyclable materials and generate environmental benefits while reducing social and environmental harms, such as plastic pollution. Producers and manufacturers of packaging, printing and writing paper, and

food serviceware will pay for many of these necessary improvements and help ensure recycling is successful in Oregon.

To implement all changes required by the Act, DEQ has engaged partners and other interested parties, gathered data and conducted research, coordinated two rounds of rulemaking, and worked thoroughly and steadily to meet the milestones necessary to launch the new program in summer 2025.

Figure 13. *The Plastic Pollution and Recycling Modernization Act mascot, Binny,* In 2023, DEQ introduced Binny through a series of videos that informed producers, service providers, and people who recycle in Oregon how implementation of the law would change their experience.

Noteworthy accomplishments for the RMA in 2023-2024:

- Adopted new administrative rules for:
    - Producer Responsibility Organization requirements
    - Local government compensation, including service expansion and transportation reimbursement
    - Materials on recycling acceptance lists
    - Recycling processor performance standards
    - Living wage and supportive benefits for workers at recycling processors
    - Fees paid by the PRO, including fees paid to recycling processors and for waste prevention and reuse
    - Standards for life cycle environmental impact evaluations
    - Covered product exemptions
- Submitted a legislative report in September 2024 that included an initial study of equity in Oregon's recycling system as well as a needs assessment for recycling at multifamily properties

- Submitted a legislative report in September 2024 containing recommendations made by the Oregon Recycling System Advisory Council to DEQ and the prospective PRO, Circular Action Alliance
- Evaluated cost-effective interventions local governments can implement to reduce recycling contamination
- Worked with Department of Administrative Services to help complete the first required assessment of state procurement policies and programs relating to the purchase of recycled materials
- Completed the first assessment of local government recycling service expansion needs

Additional upcoming milestones anticipated in 2025-2026:

- Complete review and give final approval of the producer responsibility organization program plan
- Review and approve PRO-developed educational resources and a statewide campaign to promote the new statewide recycling list
- Establish statewide contamination reduction goals and a list of contamination reduction programming elements for local governments and service providers to implement using funding from the PRO
- Permit recycling processing facilities according to new performance standards
- Provide technical assistance to regulated entities, including local governments and recycling processing facilities, that are working toward compliance with new obligations
- Complete a litter and marine debris needs assessment and a compostability study

DEQ continues to work closely with the Oregon Recycling System Advisory Council and the prospective PRO, as well as dozens of other interested parties, to help local governments, service providers, producers, businesses, and residents prepare for recycling system changes that will roll out beginning July 1, 2025.[5]

Architectural paint stewardship

Oregon has required architectural paint manufacturers to have a program to reduce waste, increase reuse and recycling and safely dispose of remaining unusable paint and other coatings since 2009.

[5] To learn more and stay informed of new developments, visit RecyclingAct.Oregon.gov.

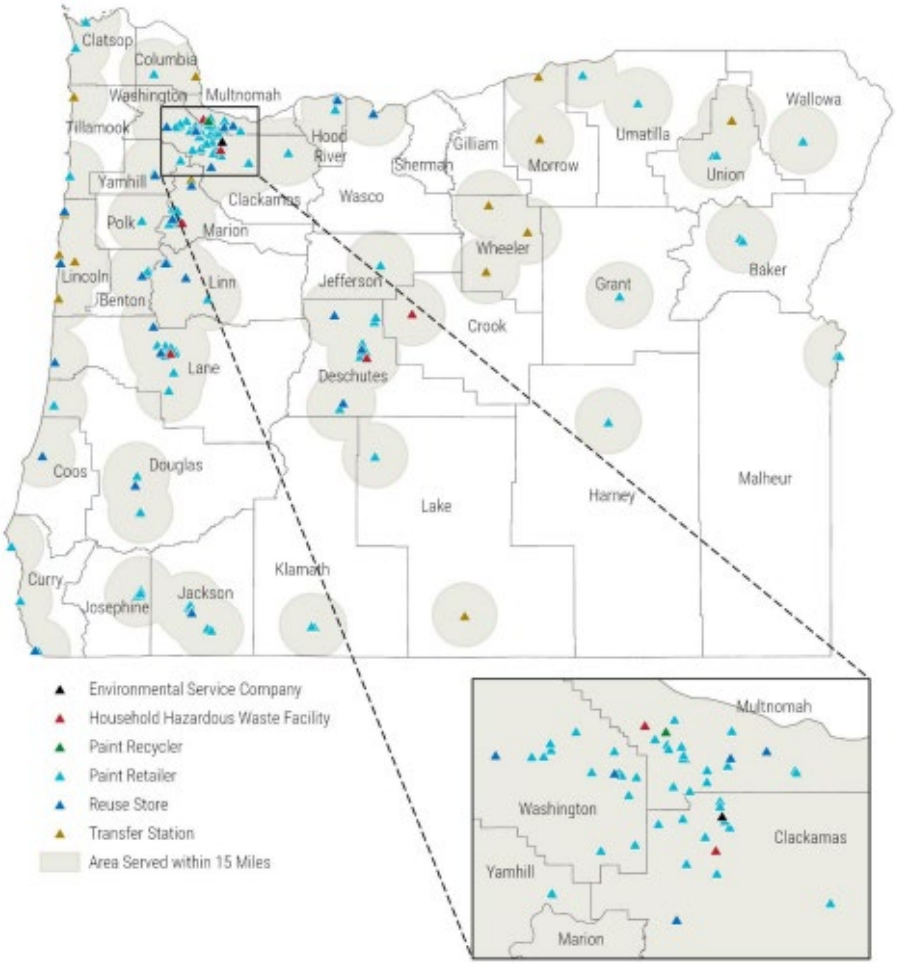

Figure 14. *Permanent drop-off sites and events in Oregon,* Image featured in Paint Care's 2023 Annual Report.

Under ORS 459A.820-855, manufacturers of latex and oil-based architectural paints, stains and coatings are required to reduce the generation of these materials to promote reuse and to provide complete end-of-life management including recycling, energy recovery and disposal. Without an architectural paint stewardship program, these substances would comprise a large share of materials delivered to household hazardous waste collection programs. When stored or disposed of improperly, these materials can be hazardous to human health, wildlife and water quality. This law has helped shift much of the cost of paint recycling from local governments and ratepayers to paint purchasers. Many Oregon counties that operate household hazardous waste programs reported cost savings on paint disposal due to decrease quantities of paint disposed.

PaintCare, an industry-run producer responsibility organization, implements this recovery program in Oregon on behalf of architectural paint manufacturers under a plan approved by DEQ. As in other states with paint product stewardship, Oregon's program is funded by a fee assessed on cans of paint, varnishes and stains purchased within the state. Between 2010 and

2023, the Oregon Paint Product Stewardship Program collected an estimated 9 million gallons of leftover paint.

In 2023, PaintCare maintained 187 permanent collection sites, mostly at retail locations, as well as many local government and solid waste facilities. Through these sites and events, PaintCare collected over 648,000 gallons of paint, varnishes and stains; 73 percent of this paint was recycled and 6 percent went to reuse.

As required by law, PaintCare last updated its program plan in 2021 for 2021-2025. A revised plan will be due to DEQ in 2025. PaintCare is still working to grow the reuse and waste prevention requirements of the program, and in 2024, submitted program goals to meet these requirements.

Oregon E-Cycles

Oregon E-Cycles is a statewide program established in 2007, financed by manufacturers, that provides responsible collection and recycling for televisions, computers, monitors, printers, keyboards and mice. Covered entities with seven or fewer items at a time may recycle their electronics at no charge at participating collection sites.

Electronics contain hazardous substances such as lead, cadmium and mercury that can harm our health and environment. They also contain valuable materials such as copper, gold and aluminum that can be recycled and used in new products. Recycling electronics conserves natural resources and keeps toxics out of landfills and incinerators.

Oregon's Electronics Recycling Law (ORS 459A.300-365) mandates a minimum level of collection service in each county, with at least one site for every city with a population of 10,000 or more. In 2023, there were 182 collection sites, including public and private transfer stations, landfills, recycling and refurbishment centers, thrift stores and retail locations.[6]

In 2023, the Legislature passed HB 3220 to update the E-Cycles program that began nearly 15 years ago, modernizing and streamlining procedures of the program. In 2024, DEQ undertook rulemaking to clarify and implement this law. On Jan. 9, 2025, the Environmental Quality Commission adopted rules on multiple topics including market share and manufacturer obligations; PRO fees; program plans and annual reports; environmentally sound management practices; fair financial compensation; coordination and product categories to clarify and implement the E-Cycles program. With the rulemaking process anticipated to be completed in

[6] DEQ's Oregon E-Cycles website provides a search tool and a hotline number for locating collection sites and services.

2025, the new program begins on Jan. 1, 2026, and will include more manufacturers in the program and more devices for collection.[7]

In 2026, manufacturers selling devices in or into Oregon will still register their brands with DEQ and join a producer responsibility organization with a plan approved by DEQ. Each program is still funded by participating manufactures and operates according to their approved plan. Retailers must inform consumers about recycling opportunities under Oregon E-Cycles; additionally, PROs must provide education statewide and on a regular basis.

Oregon E-Cycle sites collected over 300 million pounds of electronic devices since 2009, and provided significant environmental benefits, from preventing toxins from entering Oregon's landfills, to recovering precious and rare earth metals for new electronics that can reduce the need for mining more resources. In 2023, the program collected over 12.2 million pounds of electronic devices for recycling and approximately 55,000 electronic devices for reuse.

Oregon Drug Take-Back Program

In 2023-24, the Oregon Drug Take-Back Program continued to offer collection opportunities to Oregon residents for the safe and secure disposal of unwanted medicines.[8] Leftover or expired drugs can pose serious environmental and health risks. Drugs left in a household can lead to accidental poisonings, addiction or abuse. Drugs thrown in the garbage or down the drain can release chemical compounds that end up in rivers or groundwater.

Two program operators, MED-Project USA and the Drug Takeback Solutions Foundation, implement drug take-back programs under plans approved by DEQ. For the third program year ending June 30, 2024, the two program operators reported collecting a combined total of over 98,000 pounds of unwanted medicines for disposal. MED-Project reported collecting approximately 67,675 pounds of drugs for the third program year and the Foundation reported collecting approximately 30,482 pounds. For the second program year ending June 30, 2023, the two program operators reported collecting a combined total of over 83,000 pounds of unwanted medicines for destruction—an increase of nearly 18,000 pounds from the first program year. MED-Project reported collecting approximately 62,712 pounds for the second program year and the Foundation reported collecting approximately 20,328 pounds.

Information on collection opportunities is available on the program website, medtakebackoregon.org, and by calling 844-482-5322. These collection opportunities include

[7] Learn more about the program through this Oregon E-Cycles fact sheet.

[8] DEQ's Drug Take-Back Program website provides more information about the program and offers Oregon residents a convenient, safe, and secure way to dispose of unwanted prescription and over-the-counter medicines.

over 400 drop-off sites across the state that accept in-person medicine disposal and the ability to order free mail-back envelopes through the program website and 844-482-5322.

Under ORS 459A.200-459A.266, which passed in 2019, manufacturer-funded programs must offer drop-off sites, such as at pharmacies and law enforcement agencies, where drugs can be disposed of in-person. Programs must also hold collection events and offer prepaid, pre-addressed envelopes for unwanted drugs to be returned by mail. Two program operators are approved by DEQ to implement drug take-back programs in Oregon. DEQ works with the Oregon Board of Pharmacy to ensure program operators' compliance with their program plans and the Drug Take-Back Law.

Mattress recycling

In 2022, the Legislature passed the Mattress Stewardship Act (SB 1576), a product stewardship law establishing a statewide system for the financing, collection and environmentally sound management of discarded mattresses. The Act requires mattress producers to join a stewardship organization with an approved plan to develop, implement and administer a mattress recycling program. Consumers pay a fee for each new mattress they purchase, which will cover the cost of the program. The stewardship organization has determined that the cost to fund the program is Oregon is $22.50 per mattress or boxspring. As with other product stewardship programs, the organization describes how they will fulfill the requirements of the Act in a program plan which is regularly submitted to DEQ for review and approval.

The Act requires a convenient network of collection sites or events across the state for the public to access and based on their condition, with at least one site per county with a population of 10,000 or more. Counties with a population of less than 10,000 may have a permanent site, or at least one event per year. Mattresses collected will then be prioritized for reuse and renovation before recycling or disposal. Among other benefits, this law is meant to decrease illegal dumping of mattresses and the costs associated with it, while diverting materials to highest and best use within the waste hierarchy.

Administrative rulemaking was completed in 2023, and in 2024, DEQ approved a program plan from the stewardship organization, Mattress Recycling Council. The new program launched on Jan. 1, 2025. As the program continues, DEQ will review and approve annual reports and revised plans, as well as provide general oversight and enforcement.[9]

[9] DEQ's Mattress Stewardship website provides more information about the program.

Management of waste materials and disposal sites

Solid waste disposal facilities and permits

To ensure the continued proper end-of-life management of waste materials, DEQ provides regulatory oversight of solid waste management and solid waste disposal facilities. Materials Management staff does substantial work in overseeing recovery, recycling and disposal of waste. This work includes issuing permits and inspecting solid waste facilities such as industrial waste landfills, waste tire disposal sites, transfer stations and municipal construction and demolition sites. Material recovery facilities that provide solid waste treatment through conversion technology, anaerobic digesters and other composting facilities are also permitted and inspected. Materials Management staff provide technical assistance to counties and cities for recovery, recycling, beneficial use, management and disposal of waste. This includes responding to complaints, conducting site visits, ensuring compliance and helping educate the public on waste prevention, recovery, disposal and the *2050 Vision*.

In 2023 and 2024, the Materials Management Program oversaw more than 300 disposal site permits and 22 waste tire permits statewide. The numbers of permits in each major category as of December 2024 are listed in the table below, Figure 15.

	Municipal	Industrial	Total
Landfills	32	15	41
Transfer stations and material recovery facilities	147	4	151
Treatment facilities	2	4	6
Incineration/Energy Recovery	1	0	1
Anaerobic Digester Composting Facility Permit	3	0	3
Anaerobic Digester Composting Facility Registration	0	0	0
Aerobic Composting Facility Permit	17	0	17
Aerobic Composting Facility Registration	31	0	31
Conversion Technology Facility Permit and Registration		2	2
Tire permits (carrier, storage, and combined storage and carrier)	22	0	22

Figure 15. *Oregon's Municipal and Industrial Solid Waste Active Permitted Facilities Statewide, 2024.*

Many Oregon landfills closed in the past three decades and continue to be permitted to ensure that the closure process does not contaminate surface or ground water, create harmful landfill gases or cause other environmental problems over time.

DEQ aims to inspect active disposal sites annually and closed landfills every other year to verify that post-closure care (gas and groundwater monitoring) and maintenance of closed landfills are being carried out as required. Facilities also monitor disposal sites and report to DEQ.

Short-term disposal permits and beneficial use determinations

In addition to permitting solid waste disposal sites, DEQ works with businesses, local governments, state and federal agencies, ports and others to permit one-time or short-term disposal of slightly contaminated soil or sediment at locations with minimal environmental impacts. DEQ also reviews applications to beneficially use waste in ways that are productive while protecting human health and the environment, thus avoiding expensive and unnecessary disposal costs. Through these efforts, DEQ provides ways to allow redevelopment of contaminated sites, or brownfields, and construction of roads and other infrastructure to take place in a more cost-effective manner. These options also allow waste to be used as fill, to improve agricultural soil or to make new products. DEQ receives approximately five to fifteen short-term disposal authorization requests per year, and two to five beneficial use applications per year. DEQ publishes its approved beneficial use determinations online.

Composting facilities

In Oregon, composting facilities include aerobic composting facilities and anaerobic digestion facilities. The products of composting facilities provide numerous environmental benefits. When incorporated into soil, the use of compost can improve soil health and provide a more stable form of nitrogen that is less susceptible to leaching into water supplies. Compost also helps soil by reducing soil compaction and increasing water infiltration. Incorporation of compost into soil stores carbon, thus helping to reduce atmospheric carbon. Anaerobic digesters capture methane rather than releasing it to the atmosphere, which is a significant component of greenhouse gas.

Oregon currently has 49 DEQ-permitted aerobic composting facilities. Thirty-two are assessed as low risk; 16 are located on agricultural lands. There are an unknown number of farm-composting facilities under Oregon Department of Agriculture oversight.

There are three DEQ-permitted anaerobic digesters: one receives food waste and two accept manure only. There are also eight anaerobic digesters located on farms under ODA oversight using manure as feedstock; three of these have received very small quantities of food waste. Currently only three of these facilities are operating.

The Materials Management Program maintains a list of active permitted facilities including municipal solid waste disposal landfills, transfer stations, compost, material recovery facilities, waste tire and household hazardous waste facilities.

Hazardous materials management

Hazardous materials are not only found in large quantities or in industrial environments, but also found under the sink, stored in garages and sheds, and in junk drawers within the average household or small business. These hazardous items like household cleaners, paints, pesticides, motor oil and batteries, if improperly stored or disposed of, can pollute waterways, poison humans and wildlife or cause fires.[10] When these leftover household products catch fire, react, or explode under certain circumstances, they are considered hazardous waste, like the same chemicals in use on an industrial level. While industrial users are regulated to properly dispose of these hazardous wastes, households are not regulated and most small enterprise generators are exempt from regulation if they generate very small quantities. Since 1991, these materials have been managed by DEQ largely through household hazardous waste collection programs designed to safely dispose of waste toxic or hazardous products used in households and small businesses.

Figure 16. *Hazardous Waste Collection Event in Lakeview, OR in September 2024,* DEQ contracted staff discuss how to manage various types of material that were brought to the collection event.

Oregon law establishes an HHW program under ORS 459.411-418 to serve residences and small enterprises. To accomplish this, DEQ relies on education to induce voluntary household and small enterprise participation in programs operated by counties that voluntarily build

[10] See Oregon Department of Environmental Quality, "What is Household Hazardous Waste?" May 2012, and Consumer Product Information Database, managed by DeLima Associates for product manufacturers, accessed December 23, 2020.

facilities or develop regular collection event infrastructure, often incentivized with DEQ grants. There are permanent facilities for HHW disposal in 17 Oregon counties offering multiple collection opportunities each year. DEQ approves periodic collection events conducted annually in another seven counties. DEQ also uses a contractor to provide collection events on a rotating basis for 20 cities in eight rural counties and rural areas of other counties that do not themselves provide collection options. The current program provides one event every five years in each of these select cities.

In 2022, DEQ began a planning effort intended to modernize its approach to managing these hazardous materials in alignment with the *2050 Vision* and Framework for Action. The Plan's Phase I recommendations for moving forward with alternatives that go beyond end-of-life waste disposal to address preventing the problems from the beginning of the material life cycle were presented to DEQ by the plan contractor in December 2024.

Inspections and complaints response

Materials Management staff respond to solid waste complaints about illegal disposal and unpermitted disposal, as well as concerns about odors, dust, asbestos or other environmental concerns at disposal sites. Between January 2023 and October 2024, DEQ received 379 complaints: 51 in the Eastern Region, 119 in the Northwest Region and 209 in the Western Region.

The Program's investigations of complaints are part of DEQ's overall effort to ensure businesses and individuals comply with state and federal environmental laws. DEQ uses a variety of tools to achieve compliance, including technical assistance, compliance inspections, investigation of complaints, warning letters, assessment of civil penalties and compliance orders. Most violations are resolved through informal enforcement: warning letters or warning letters with opportunity to correct. Repeated or more serious violations can result in a formal enforcement action that includes a civil penalty. Formal enforcement actions are handled by the Office of Compliance and Enforcement. DEQ maintains a list of enforcement actions and penalties.

From January 2023 through December 2024, 13 companies and individuals subject to some type of Materials Management investigation were assessed civil penalties totaling $342,123. Of these 13 cases, DEQ issued ten to unpermitted sites, two to sites with some type of solid waste disposal site permit and one to an electronics manufacturer for E-Cycles violations.[11] In some of these cases, the penalties reflect not only assessments for Materials Management violations, but also for water quality, hazardous waste or other violations of DEQ rules or permits.

[11] This is likely an undercount of Materials Management violations and penalties due to enforcement led by other programs sometimes also containing a Materials Management violation and/or penalty.

Metro's waste reduction program: compliance with state requirements

In 2019, Metro published the 2030 Regional Waste Plan, which establishes a sustainable materials management approach for the Metro region through addressing impacts across the full life cycle of materials and products. Metro evaluates progress toward each goal in the plan by monitoring the status of action items and by measuring indicators over time. The Regional Waste Plan calls for numeric indicators to be reported at least every three years. Indicators were last reported in Metro's 2022 Progress Report.

Per Oregon state statute, Metro reports to the Environmental Quality Commission on the implementation of its solid waste reduction program including the current status of implementation, a summary of the amount and percent of solid waste that is currently reused, recycled or disposed of in solid waste disposal sites, and a summary of the metropolitan service district's solid waste budget. Metro published its latest annual progress report in 2024.[12]

Conclusion

Materials play a significant role in human and environmental health. People in Oregon and around the world produce, use, consume and discard materials every day. These materials impact the environment as well as the health of people who interact with them, such as people living near solid waste facilities and workers employed to extract, manufacture and dispose of the materials. In the 12 years since the adoption of the *2050 Vision*, the Materials Management Program implemented programs and policies to reduce these impacts for a prosperous tomorrow. Looking forward to the next biennium, the Program will facilitate advancements in product stewardship programs, implement the Recycling Modernization Act, apply U.S. EPA funding to bolster and diversify existing work related to pollution reduction, and continue dedicated support for initiatives within and beyond DEQ that advance wellbeing and equity. With the *2050 Vision* as a leading luminary, Materials Management will continue to collaborate with federal, state and local partners to create a more sustainable future where environmental protection and resource conservation enhance the wellbeing of all people in Oregon.[13]

---

[12] The status of the metropolitan service district's waste reduction program as submitted to the commission under ORS 459.345.

[13] DEQ's Materials Management Program website provides more information about all the programs and projects mentioned in this report.

Appendix A

Glossary of Terms

Built environment: An expansive network including the buildings we live in, the distribution systems that provide us with water and electricity, and the roads, bridges, and transportation systems we use to get from place to place. It can generally be described as the man-made or modified structures that provide people with living, working, and recreational spaces. Creating all these spaces and systems requires enormous quantities of materials.

Consumption: The using of a resource, product, or material. In the *2050 Vision*, "consumption" typically refers to the stage in the life cycle of a product where it is acquired and used, following production but prior to end-of-life management. "Consumption" in the context of the consumption-based greenhouse gas emissions inventory refers to the purchase of goods and services by households and governments, as well as business purchases that are classified as capital or inventory formation (economic final demand).

Consumption-based greenhouse gas emissions inventory: An estimation of the quantity of gases contributing to climate change that are associated with consumption (economic final demand). A consumption-based inventory is sometimes contrasted with a territorial or sector-based inventory, which estimates the emissions that physically originate within a community (e.g., Oregon). In contrast, many of Oregon's consumption-based emissions occur in other states and countries, in the course of producing goods and services for consumption in Oregon.

Cost: Everything given up to acquire or provide a material or service, or achieve a goal. Cost can include direct transfers of money (as reflected in market prices of acquiring or providing a material or service) as well as other components not typically reflected in the market price, such as time, opportunity, health, and environmental quality.

Ecomodulation: A common element in product stewardship or extended producer responsibility initiatives, ecomodulation is the concept of penalizing the use of materials that are less environmentally friendly and rewarding the use of those which are better. For example, through charging a higher rate of tax for products that are harder to recycle or offering fee reductions for materials which can be easily recycled.

Extended producer responsibility (EPR): A type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for its product extends to post-consumer management of that product and its packaging.

Green chemistry: The invention, design, and application of chemical products and processes to reduce or to eliminate the use and generation of hazardous substances.

Life cycle assessment (or analysis), LCA: A standardized process used to estimate the impact that a product or process has over the whole of its lifespan, including extraction of raw materials, production, transport, use, and disposal.

Life cycle approach: Materials have environmental impacts throughout their life cycles. The major stages in a material's life cycle are raw material acquisition, materials manufacture, production, use/reuse/maintenance, and waste management. By looking at a product's entire life cycle—from materials extraction to end-of-life management—we can find new opportunities to reduce environmental impacts, conserve resources, and reduce costs.

Materials management: An approach to reduce environmental impacts by managing materials through all stages of their life. Materials management identifies impacts and actions across the full cycle of materials and products as they move through the economy— from raw material extraction to product design and manufacture, transport, consumption, use, reuse, recycling, and disposal.

Product stewardship: The act of minimizing health, safety, environmental, and social impacts and maximizing economic benefits of a product and its packaging throughout all life cycle stages. The producer has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role. Stewardship can be either voluntary or required by law.

Equity: The just, fair and equitable distribution of resources across populations.

Sustainability: Using, developing, and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic, and community objectives.

Waste management: A subset of materials management specifically addressing the management of discards; often used to include, recycling, material recovery, composting, energy recovery, and landfilling.

Waste prevention: To reduce the amount of solid waste generated or resources used, without increasing toxicity, in the design, manufacture, purchase, or use of products or packaging.

Appendix B

Factors impacting material recovery rates

Among the causes of the decline in recovery rates, three key factors stand out:

1. **Wood:** Wood waste recovery has sharply declined in the past 14 years, as major paper mills and other users of wood waste as fuel either closed or switched to natural gas or alternative fuels. This resulted in more than doubling the amount of wood disposed between 2010 and 2022 (Figure 17).

2. **Paper:** With the rise of electronic communications, the amount of newsprint and printing and writing paper in curbside recycling has plummeted (Figure 18). In 2023, based on preliminary results from DEQ's commingled recycling composition study, newspaper made up only 4 percent of the residential commingled mix–compared to 47 percent in 2005. Cardboard generation has increased in recent years with the increase in home-delivery of purchased goods. On a per-capita basis, the tons of cardboard generated is still below 2008 levels.

3. **Plastics:** Despite disruptions to the global plastic and paper recycling markets in 2018, that same year bottle bill plastic recycling increased sharply and has continued to rise. The tons of plastic recycled has decreased over the last decade in spite of greater production and use of plastics (Figure 19).

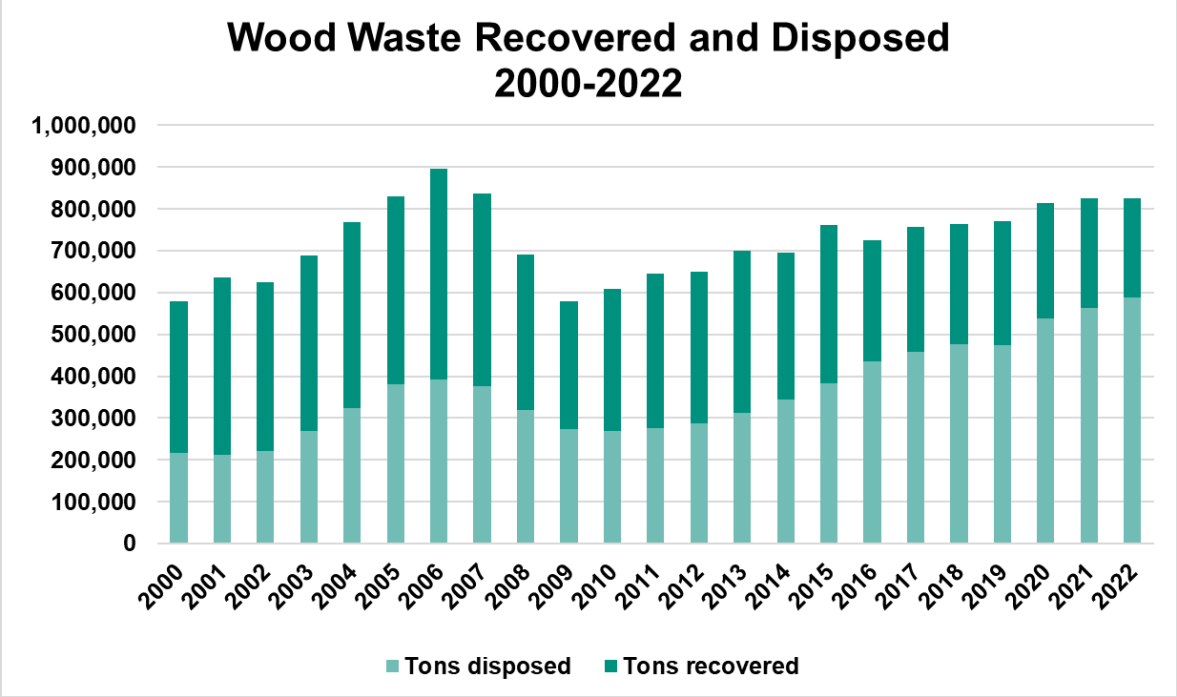

Figure 17. *Wood Waste Recovered and Disposed, 2000-2022,* The amount of wood disposed in Oregon more than doubled between 2010-2022.

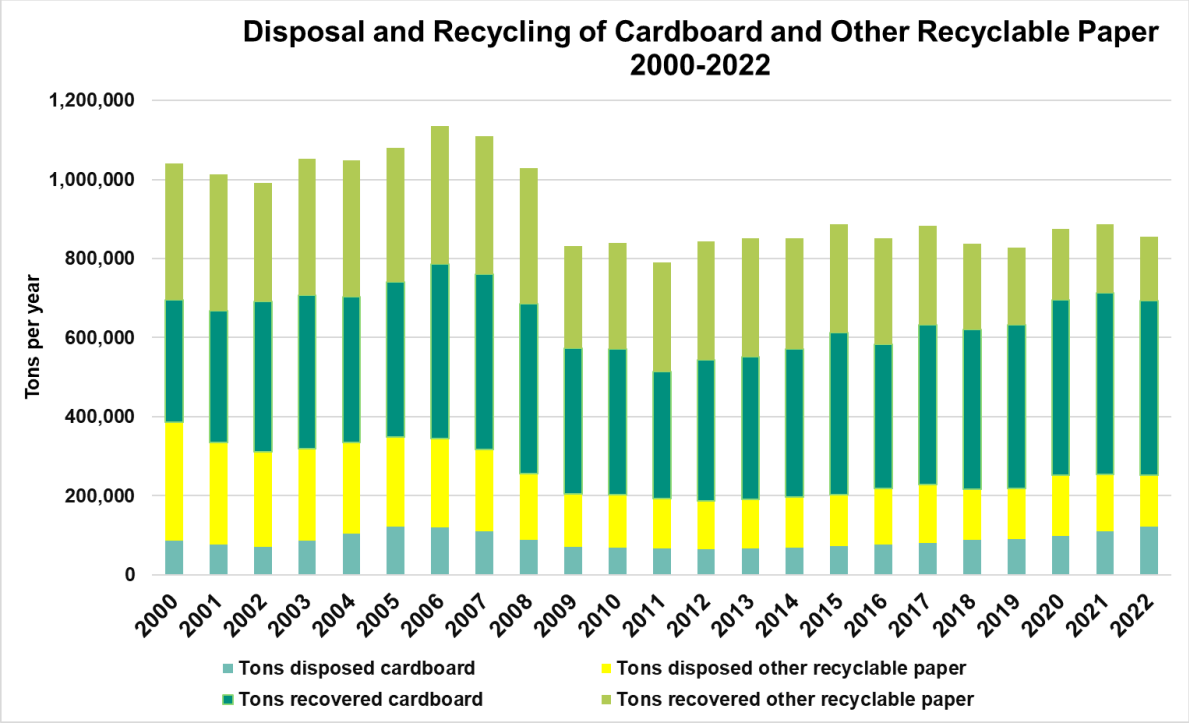

Figure 18. *Disposal and Recycling of Cardboard and Other Recyclable Paper, 2000-2022,* The tons of disposed cardboard and other recyclable paper has declined significantly since 2008, partially due to a decline in use for newsprint and printed materials.

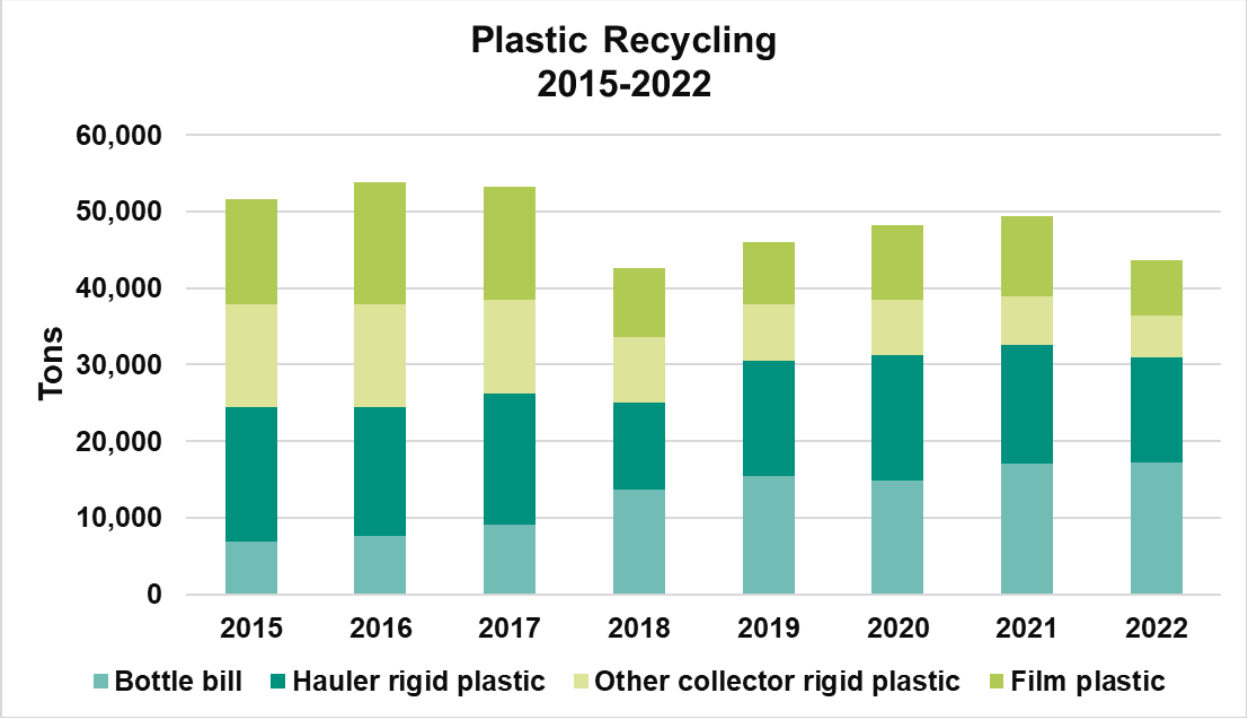

Figure 19. *Plastic Recycling, 2015-2022,* The amount of recycled tonnage for each type of plastic since 2015.