2016 Oregon Material Recovery and Waste Generation Rates Report

By:

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November 2017

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

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Acknowledgments

The Oregon Department of Environmental Quality's Materials Management Program conducted the 25th annual Oregon Material Recovery Survey for calendar year 2016. DEQ extends its appreciation to industry representatives, collection service providers, local governments, and landfill administrators and staff for providing recovery and disposal data for 2016, and working with DEQ staff to complete this report. The survey team also thanks DEQ personnel who contributed to the accuracy and integrity of the information contained in this report:

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This report provides one of the most complete and accurate collections of state-level disposal and recycling data in the country.

Table of Contents

Executive Summary

The materials life cycle

The materials used by Oregonians create environmental impacts at every stage of their life cycles, from resource extraction to "end-of-life," when materials enter the waste stream. Likewise, environmental impacts might be reduced through action at any stage of the cycle.

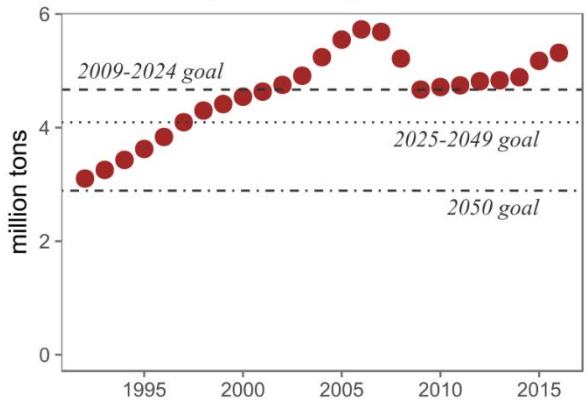
This report focuses on actions at end-of-life, when materials are either disposed of or recovered.

- *Disposal* refers to all materials placed in landfills and many materials burned in incinerators.
- *Recovery* refers to materials being re-utilized. This includes recycling, composting, and some incineration for energy recovery.
- *Generation* is the sum of disposal and recovery and represents the total tonnage of the waste stream.
- The *recovery rate* is the percentage of generation recovered.

Oregon law has long-term goals for reducing generation and increasing recovery, illustrated in the adjacent charts. However, in 2016, Oregonians moved away from those goals. In 2016 Oregonians:

- Generated 5,316,989 tons of waste, up 2.7 percent from 2015;
- Disposed of 3,050,432 tons into landfills and incinerators, up 9.6 percent from 2015; and
- Recovered 42.6 percent of the waste generated, down from 46.2 percent in 2015.

Oregon waste generation

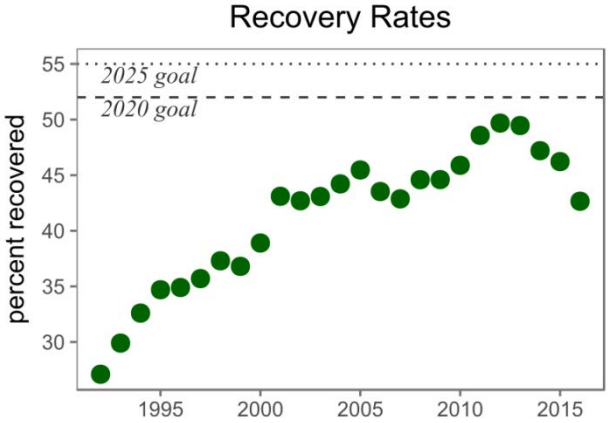


The rise in generation was likely due mainly to an improved economy resulting in increased construction and more purchasing of goods. The decline in recovery was partly due to the loss of markets for wood recovery, with the closure of the paper mill that was the largest user of wood waste in Oregon, and some other mills switching from wood to natural gas as fuel. Cardboard and other papers also unexpectedly showed a decrease in recovery in 2016. DEQ would have expected cardboard recovery to increase with improved economic conditions and more home delivery of products in cardboard boxes.

Recovery via recycling and other means has environmental value. Compared to a scenario where economic demand for materials is satisfied through new production, recovery activities:

- Prevented the use of 27 trillion BTUs of energy, equivalent to 2.8 percent of the state's total energy use.
- Prevented the emission of 2.9 million metric tons of carbon dioxide equivalents, equal to 4.7 percent of all greenhouse gas emissions statewide.

Recovery Rates



In 2017 and 2018, Oregonians will be challenged to increase their recovery rate to approach the 2020 and 2025 goals. Equally important, they will be challenged to reduce overall environmental impacts by reducing generation, and acting throughout the materials life cycle.

Introduction and Purpose

This report describes results and methodology for Oregon's Material Recovery Survey for calendar year 2016. "Material recovery" includes materials collected for recycling, for composting, and for materials meeting certain criteria, for energy recovery. Each year, the Oregon Department of Environmental Quality compiles data on municipal post-consumer waste recovery. DEQ sends a survey to all collection service providers and private recycling companies that handle materials for recycling, composting and energy recovery. Survey data is combined with data gathered from quarterly and annual disposal site reporting forms. Together, recovery and disposal numbers make up the amount of waste generated by Oregonians each year.

Total Recovered
2,266,556 tons

= *Recovery Rate*

Total Generated
(Total Recovered + Total Disposed)
5,316,989 tons

2016 OR Rate
42.6%

DEQ uses this information to estimate energy savings and greenhouse gas reductions, two important environmental benefits from material recovery. DEQ also uses it to calculate material recovery rates and waste generation. The recovery rate is the percentage of the total waste generated in Oregon that is recycled, composted or recovered for energy. Waste generation is the amount of waste recovered plus the amount of waste disposed. Recovery, disposal and generation data, as well as recovery rates, are calculated both for the state and for each of Oregon's 35 individual wastesheds.

Individual wastesheds also use this information to implement and improve their waste prevention and material recovery programs.

This is the 25th year that DEQ has used the survey to gather this data. The 1991 Oregon Legislature enacted requirements for this annual survey and set goals for state and local recovery rates. These recovery goals were amended by the Legislature in 2001, and then again in 2015 (effective 2016). New wasteshed goals now range from 15 percent (Lake Wasteshed) to 64 percent (Metro and Marion Wastesheds) by 2025. The new statewide recovery goals are 52 percent recovery by 2020 and 55 percent recovery by 2025.

The Legislature in 2001 also established statewide goals for reducing waste generation. These goals were also revised by the Legislature in 2015. The new waste generation goals require that the generation of solid waste in the years 2025 to 2049 shall be 15 percent below the amount of solid waste generated in 2012, and for 2050 and beyond, the generation goal is 40 percent less than the waste generated in 2012.

Requirement to Report

Oregon law requires that all publicly and privately operated recycling and material recovery operations complete a Material Recovery Survey form. This includes landfills, local recycling collectors, private recycling collection companies and depots, transfer stations, material recovery facilities, composters, local governments and any other operation that handles post-consumer recoverable materials. One exception, due to the difficulty of separating post-consumer scrap metal from commercial and industrial scrap metal, are companies handling only scrap metal. These companies are not required to report on privately obtained post-consumer scrap metal, but many do report on a voluntary basis.

The survey requires that companies report all recyclable materials they handle, including amount collected, county of origin, the company they received any transfers from, and where or to whom the materials were marketed.

Oregon law further requires DEQ to keep confidential the information reported by private recyclers. This includes customer lists and specific amounts and types of materials collected or marketed by individual companies. Only aggregated information may be released to the public.

Materials Included in the Analysis

Oregon's analysis of the environmental benefits from material recovery and the recovery rates includes only post-consumer materials generated in Oregon for recycling, composting or energy recovery. Waste from manufacturing and industrial processes (pre-consumer materials), reconditioned and reused materials, material that can be disposed of as clean fill without being put in a landfill such as brick and concrete, and waste originating out of state (but handled in Oregon) are excluded. Some scrap metals, including discarded vehicles or parts of vehicles and metal derived from major demolition activities handled by scrap metal dealers, are also excluded. Scrap metal collected at disposal sites by collection service providers, at community recycling depots or through municipally sponsored collections events counts as recovered material.

The first Material Recovery Survey for the 1992 calendar year included 30 types of materials. Since then, some new materials have been added and other materials consolidated, so that the survey now contains 33 types of material. The major materials for 2016 are:

- Cardboard
- Paper Fiber – Other paper fiber (combined high-grade paper, newsprint and mixed scrap paper) not including cardboard.
- Plastic – Rigid plastic containers, plastic film, other plastics and composite plastic (including carpet pad).
- Glass – Container glass and other glass such as window panes and ceramics.
- Electronics – Computers, TVs, printers, cell phones, computer parts, video games consoles, and similar devices
- Metals – Tinned cans, aluminum and other scrap metals
- Wood Waste
- Yard Debris
- Food Waste – Residential and commercial food waste
- Other – Tires, used motor oil, antifreeze, used carpeting, batteries of all types, gypsum, asphalt roofing materials, textiles, paint, household hazardous waste/solvents, and animal waste.

Energy Savings and Greenhouse Gas Reduction

DEQ uses information from the Material Recovery Survey to estimate energy savings resulting from recycling and counting energy recovery, as well as reductions in greenhouse gases associated with recycling, composting and counting energy recovery.

Energy

When recycled materials replace virgin feedstock in manufacturing, energy savings are significant. Making aluminum from old beverage containers uses 93 percent less energy than making aluminum from bauxite. Newsprint made from old newspapers requires 46 percent less energy than making newsprint from wood. While the energy conservation benefits of recycling have long been recognized, quantifying these estimates can be difficult. The U.S. Environmental Protection Agency developed a waste reduction model to estimate the amount of per-ton energy savings for recycling for a wide variety of materials. [1]

For 2016, DEQ applied the estimates from EPA's model to tons recycled and counting tons recovered for energy (composting is not included.) Material categories from Oregon's survey do not perfectly align with the material categories in EPA's model, so some assumptions were made in classifying materials. Additionally, EPA's model is based on national averages, which may not be representative of Oregon's recycling and energy recovery markets. Regardless, the use of EPA's model allows for a rough estimate of the energy saved from materials recycled and recovered for energy by Oregonians. Energy recovery includes the conversion of certain wastes to energy via processes such as thermal conversion to electricity, direct combustion for heat, and pyrolysis of waste plastics into synthetic fuels. DEQ estimates that recycling by Oregon households and businesses in 2016 (counting only wastes generated in Oregon, not those generated elsewhere and shipped to Oregon for recycling) led to energy savings of approximately 24.8 trillion British thermal units. The energy produced by energy recovery saved an estimated additional 2.2 trillion BTUs.

To put the energy savings number into context, based on U.S. energy information statistics, total energy use in Oregon across all sectors (transportation, electricity, heating, industry) in 2015 was 238 million BTU per-capita. If per-capita use remained constant through 2016, then the energy savings from recycling and counting energy recovery equates to a 2.8 percent offset of total energy use. This can also be expressed as equivalent to approximately 216 million gallons of gasoline saved in 2016. These comparisons are not perfect. Many of Oregon's recyclable materials are exported to other states or countries, so the energy conservation benefits occur elsewhere. The actual energy saved by recycling includes a mix of not only gasoline and other liquid fossil fuels, but also coal, hydroelectric, nuclear and wood. Nonetheless, the energy savings from recycling and, to a lesser extent, energy recovery in Oregon, are significant.

Greenhouse Gases

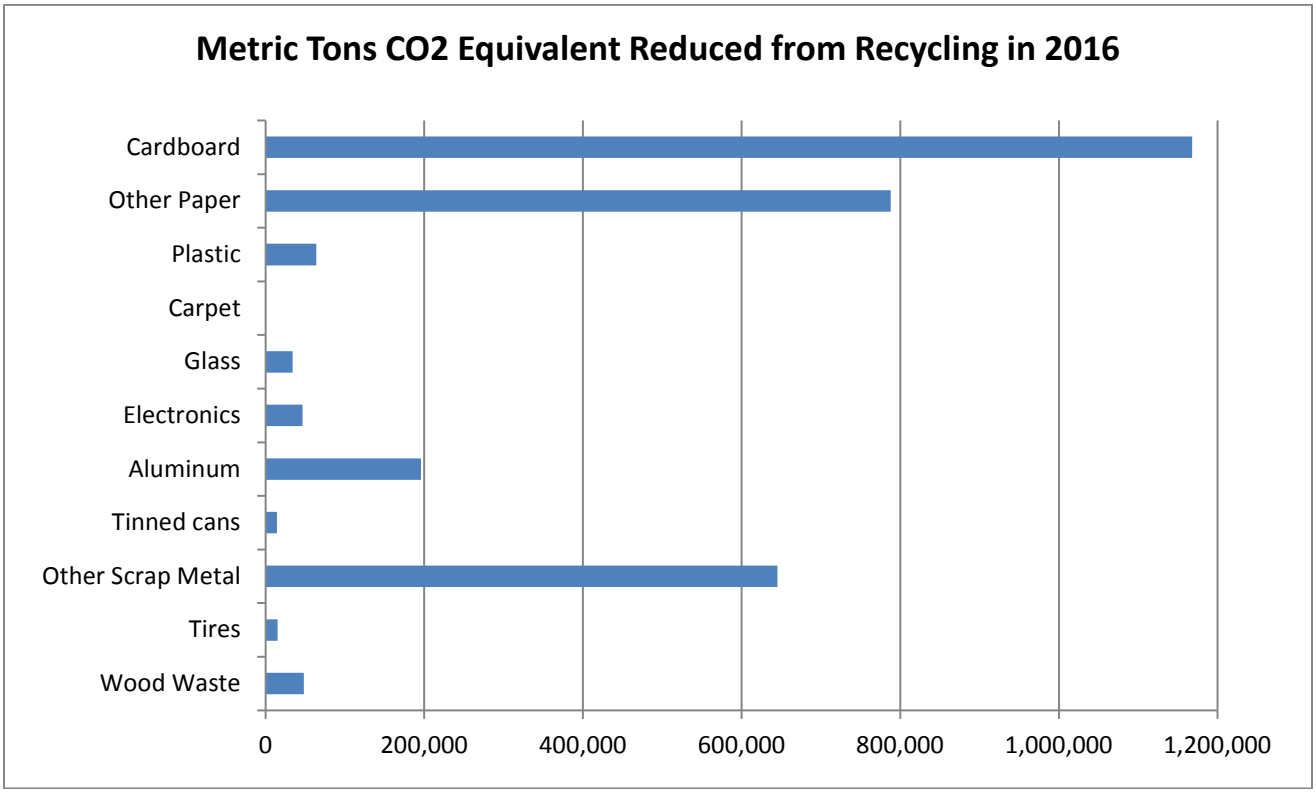
EPA also publishes greenhouse gas emission factors allowing for estimation of greenhouse gas benefits due to recycling, composting and counting energy recovery. The greenhouse gas benefits include a variety of emissions, carbon sinks and emission offsets, which vary by material, management method and the disposal site if the materials were not recovered. Major categories of sinks and offsets include increased carbon storage in forests

[1] The methodology for obtaining these estimates has changed several times since 2005. Comparisons should not be made between the results for 2015 and previous years.

when recycled paper displaces wood fiber, reductions in fossil fuel use due to the energy savings of recycling, and reductions in methane emissions at landfills.

Net greenhouse gas reductions associated with materials recycled, composted and burned for energy in 2016 are estimated at 2.9 million metric tons of carbon dioxide equivalents. This includes only materials that are counted in the Material Recovery Survey and excludes any materials generated in other states and shipped to Oregon for handling. An interesting effect of using EPA's published emission factors and Oregon landfill data for comparison is that composting yard debris is shown to add, rather than reduce, greenhouse gas emissions. The reason is that woody material break down very slowly and sequesters carbon in the landfill, but this is balanced by weeds, leaves, and grass, which decompose quicker and can form methane, a potent greenhouse gas, under anaerobic landfill conditions. The net impact is small, and other benefits of composting outweigh this shortfall. Further, EPA's emission factors for yard debris composting vs. landfilling are believed to contain significant uncertainty, and are the topic of considerable discussion and research.

Net greenhouse gas emissions for Oregon in 2016 (based on an average of 2013 to 2015 per-capita emissions and applying that average to Oregon's 2016 population), using the state's "in-boundary" emissions inventory, are projected at 62.5 million metric tons of carbon dioxide equivalents. Thus, recycling, composting and counting energy recovery provide a greenhouse gas reduction corresponding to approximately 4.7 percent of net statewide emissions (from all sources). Most of the benefit is a result of recycling activities, as opposed to composting or energy recovery. In fact, composting and energy recovery, in total, are believed to slightly increase overall emissions of greenhouse gases.



Comparing recovery-related greenhouse gas reductions (2.9 million metric tons) with statewide emissions (62.5 million metric tons) is potentially misleading because the emission reductions from materials recycled and composted in 2016 occur over multiple years, while the estimated emissions of 62.5 million metric tons are "same-year" (2016) emissions. The reductions from recycling and composting are spread over multiple years because they include avoided methane emissions from slow decay in landfills, as well as an increase in long-term carbon sequestration in forests and agricultural soils treated with compost. However, just as some of the

greenhouse gas benefit from recycling and composting in 2016 will actually occur in subsequent years, some of the greenhouse gas reduction counted for previous years actually occurred in 2016.

Another way to look at the greenhouse gas reductions is to express emission reductions in terms of average cars. Using data from the EPA, Oregon Department of Transportation and Oregon Department of Energy, DEQ estimates that 2.9 million metric tons of carbon dioxide equivalents is comparable to the greenhouse gas benefit of eliminating tailpipe emissions from approximately 690,000 “average” passenger cars. As with energy savings, the greenhouse gas benefit of recycling is significant. Not generating waste in the first place likely produces even greater greenhouse gas and energy benefits, but these benefits are not estimated here.

Recovery Rates

The recovery rate is the percentage of total waste generation that is recovered. DEQ calculates both the statewide recovery rate and a recovery rate for each of the 35 individual wastesheds in the state. Beginning in 2001, we presented these recovery rates both with and without recovery credits as allowed by law; however, use of the two percent credit allowance expired with the 2015 recovery rate. As a result only a single calculated rate is reported.

Oregon State Recovered Tons and Recovery Rates

Year	Tons Recovered	Tons Disposed	Calculated Rate	Total Rate*
1992	839,679	2,263,099	27.1	-
1993	974,685	2,280,513	29.9	-
1994	1,118,912	2,312,669	32.6	-
1995	1,257,204	2,362,146	34.7	-
1996	1,338,259	2,497,170	34.9	-
1997	1,462,114	2,633,017	35.7	-
1998	1,604,985	2,695,903	37.3	-
1999	1,626,271	2,788,699	36.8	-
2000	1,765,817	2,778,463	38.9	-
2001	1,999,085	2,635,072	43.1	46.8
2002	2,029,261	2,723,365	42.7	46.3
2003	2,116,880	2,796,787	43.1	46.8
2004	2,317,064[1]	2,923,462	44.2	48.0
2005	2,523,367[1]	3,026,457	45.5	49.2
2006	2,494,050[1]	3,235,828	43.5	47.3
2007	2,437,569[1]	3,248,126	42.9	46.6
2008	2,326,146[1]	2,890,503	44.6	48.2
2009	2,082,631[1]	2,586,721	44.6	48.3
2010	2,163,957[1]	2,523,808	46.2	49.9
2011	2,306,124[1]	2,437,767	48.6	52.3
2012	2,391,490[1]	2,424,833	49.7	53.4
2013	2,391,714[1]	2,437,700	49.5	53.3
2014	2,308,105[1]	2,580,933[1]	47.2	51.0
2015	2,392,117[1]	2,783,726[1]	46.2[1]	49.9[1]
2016	2,266,556	3,050,432	42.6	

***** These rates are including the addition of credit allowances enacted by the 2001 Legislature.

[1] These tonnage figures are corrected from earlier published values.

2016 Statewide Recovery Rate

In 2016, the state recovered 2,266,556 tons of material. This represented 42.6 percent of the municipal post-consumer waste stream, well below the statewide goal of 52 percent recovery by the year 2020. Recovered tons decreased 5.2 percent from the previous year surveyed, 2015.

From 1992 through 2005, tons of material recovered increased regularly each year. From 2006 through 2009, recovered tons declined even though recovery rates were fairly flat, as declining consumption of newspapers and magazines, followed by a general decline in consumption from the recession reduced the amount of material available to be recovered. Beginning in 2010, we saw an increase in recovery, as the economy gradually recovered from the recession; however, recovered tons decreased again in 2016, as compared to the increase in 2015. With an active economy and construction sector, Oregonians generated more waste than in 2015. However, wood waste recovery was about 89,000 tons less in 2016 than 2015, due to closure of the largest paper mill that accepted wood waste for fuel, and other companies moving to natural gas as a fuel instead of burning wood. Unexpectedly, cardboard recovery also decreased substantially, falling more than 43,000 tons or nearly 12 percent of the cardboard tonnage recovered in 2015. These factors contributed to the recovery rate's continued decline since its peak in 2012.

A total of 3,050,432 tons of municipal post-consumer waste from Oregon were disposed in 2016, up 9.5 percent from 2015. This is still well below the peak disposal tonnage in 2007. Per-capita disposal increased 7.9 percent to 1,497 pounds per person. This is only 1.1 percent lower than the 1992 figure of 1,513 pounds per person.

Total tons disposed added to total tons recovered equaled 5,316,989 tons of total waste generated in 2016 (see Waste Generation on page 12). Total generation rose by 2.7 percent, with per-capita generation increasing by 1.2 percent from 2015 levels.

Waste recovery decreased (-125,561 tons) while disposal increased 9.5 percent (+266,707 tons), resulting in the increase in generation (+141,146 tons). Waste generation was 412,890 tons less in 2016 than it was at its peak in 2006. This is a drop of 7.2 percent in waste generation between 2006 and 2016, or nearly 16 percent if measured on a per-capita basis.

How DEQ Calculates the Statewide Recovery Rate

DEQ combines information about quantities of material collected from privately-operated recycling and material recovery facilities with recovery information from collection service providers and disposal site collections, in a manner that eliminates double-counting of material that is passed on from collectors through processors to end-users. This determines the total weight of material recovered.

Next, DEQ adds the total weight of material recovered to the total weight of material disposed, obtained from disposal site reports. This sum is the total weight of material generated. The total weight of material recovered is divided by the total weight generated. This results in the calculated recovery rate.

In 2001, the Oregon Legislature changed the method of calculating the total recovery rate for the state to include part of the two percent reuse and residential composting credits (but not waste prevention credits) earned by wastesheds. This statutory change required a more complex series of calculations to determine that part of the wasteshed credit amounts that are added the calculated state recovery rate to obtain the total statewide recovery rate. In 2015, the Oregon Legislature eliminated these credits from being included in the statewide and wasteshed recovery rates. As a result the 2016 calculation of recovery rates is again just the total weight of material recovered divided by the total weight generated.

How DEQ Calculates Individual Wasteshed Recovery Rates

The total weight of material recovered is allocated to the wasteshed of origin. Direct collectors of materials are the primary and best information source for the collected materials' wasteshed of origin. When information from direct collectors is not available, or when a survey respondent does not know the wasteshed of origin for the collected materials, the markets' and end users' estimates are the secondary method used to allocate material back to wastesheds. Material is allocated back to wastesheds based on population in rare cases when survey respondents and market information is insufficient.

DEQ also allocates the total weight of material disposed to the wasteshed of origin. For each wasteshed, total weight of material disposed is added to total weight of materials recovered to ascertain the amount of waste generated in the wasteshed. The total weight of material recovered is divided by the total weight generated to determine the calculated recovery rate for each wasteshed.

Prior to 2016, individual wastesheds were allowed to claim recovery credits for waste prevention, reuse and residential composting. Each wasteshed had to apply for credits as part of its annual Opportunity to Recycle Report submitted to DEQ. DEQ reviewed credit applications to determine whether credits qualified under statutory criteria. Each wasteshed could claim up to three two percent recovery rate credits (for no more than a total of six percent), one credit each for reuse, waste prevention and residential composting programs. These credits were added to the calculated recovery rate to obtain the total recovery rate and then used to determine whether a wasteshed was achieving its recovery goal. In 2015, the Oregon Legislature eliminated these credits from being included in the statewide and wasteshed recovery rates.

Marion County Adjustment

As home to the state’s only municipal waste-to-energy incinerator, Marion County’s recovery and disposal tonnages are revised each year to include certain wastes burned for energy as recovered, as directed by the 2001 Legislature. For 2016, the six materials that could be counted toward the recovery rate when burned for energy

were wood, yard debris, used motor oil, fuels, paint and plastics. In 2016, 12,481 tons of these materials burned for energy in the county's incinerator were counted as recovered instead of disposed. DEQ obtained this tonnage by multiplying the quantity of non-industrial, in-county, counting solid waste processed at the facility by the percentage that those six materials make up of Marion County's municipal solid waste disposal stream. Marion County also recovered 8,529 tons of scrap metal from the incinerator ash. DEQ subtracted the scrap metal tonnage from the Marion County disposed tons so that the same tons would not be counted as being both disposed and recycled.

Wasteshed Recovery Rates

Oregon has 35 individual wastesheds[1], each with its own recovery rate and goal. Based on the new goals established by the Oregon Legislature in 2015 (Oregon Revised Statute 459A.010), 11 wastesheds are already at or above their goal for 2025.

The Survey Report Tables listed on page 17 of this report show 2016 recovery rates for each wasteshed (Table 1), tons of materials recovered in 2016 by wasteshed (Table 2), and tons of solid waste disposed by wasteshed in 2016 (Table 3).

For a historical look at recovery, disposal and generation data in Oregon, see Survey Report Tables 4, 5, 6 and 7, which provide the recovery rates, recovered material tons, disposal tons, and tons of solid waste generated each year since the Material Recovery Survey began in 1992.

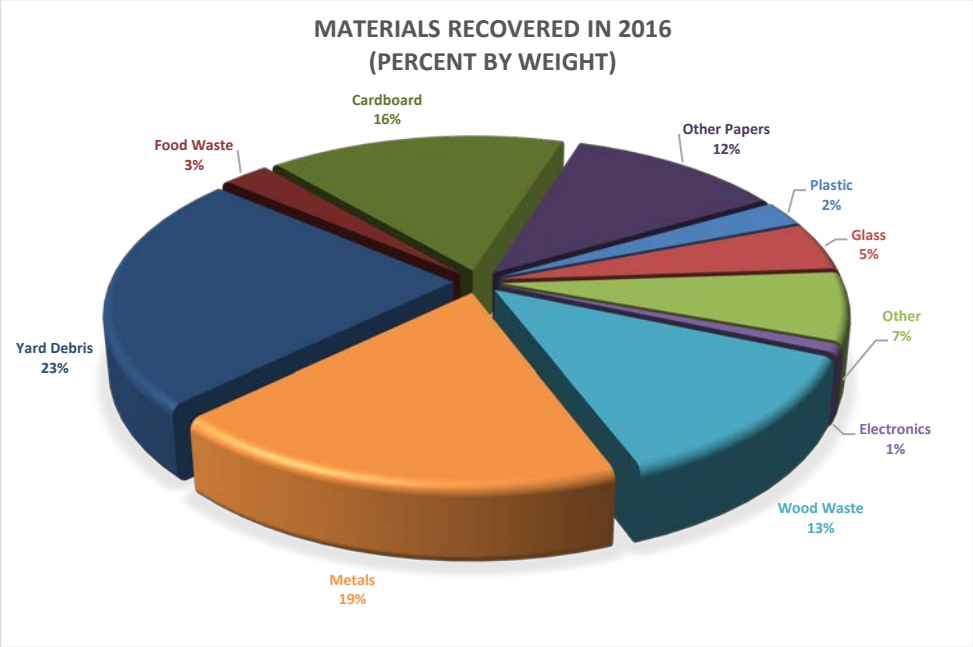
[1] A "wasteshed" is defined in Oregon law as being an area of the state that shares a common solid waste disposal system, or an appropriate area in which to develop a common recycling system. For the most part, individual Oregon counties are designated as wastesheds. The two exceptions are that:

- The greater Portland tri-county area, consisting of Clackamas, Multnomah and Washington Counties, is designated as the Metro wasteshed.
- Milton-Freewater, a city within Umatilla County, is designated as a separate wasteshed.

Materials Recovered

Oregon's material recovery rate for 2016 includes materials that were recycled, composted (including yard debris, food waste and some wood waste), and burned for energy (including tires, fuels, oil-based paint, used oil, wood waste and some yard debris). Sixty-three percent of the material recovered was recycled, 24 percent was composted and 13 percent was burned for energy.

The chart below shows major categories of materials recovered in 2016 and the percentage of total recovery (by weight) for each category. Specific materials included in these categories are listed on page 7.



The following describes changes in amounts of materials recovered in 2016 as compared to 2015:

Metals. The total amount of recovered metals decreased by three percent in 2016 in addition to a four percent decrease in 2015. This may be due to scrap metal prices continuing to drop in 2016.

Paper (including cardboard). In 2016, paper fibers decreased by eight percent in recovered tons from 2015, after having increased by four percent the previous year. The majority of the tonnage decrease was in cardboard recovery. This decline was unexpected, since prices for recycled cardboard were higher in 2016 than in 2015.

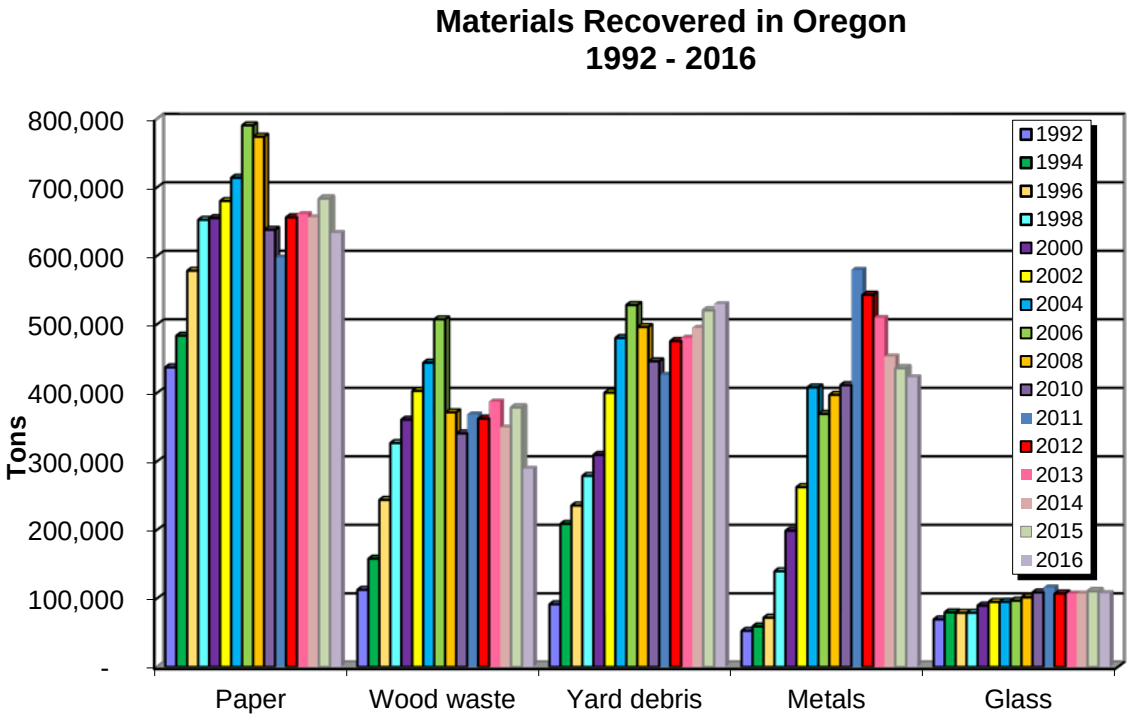
Plastic. Total plastics recycling increased by more than four percent in 2016 as compared to 2015.

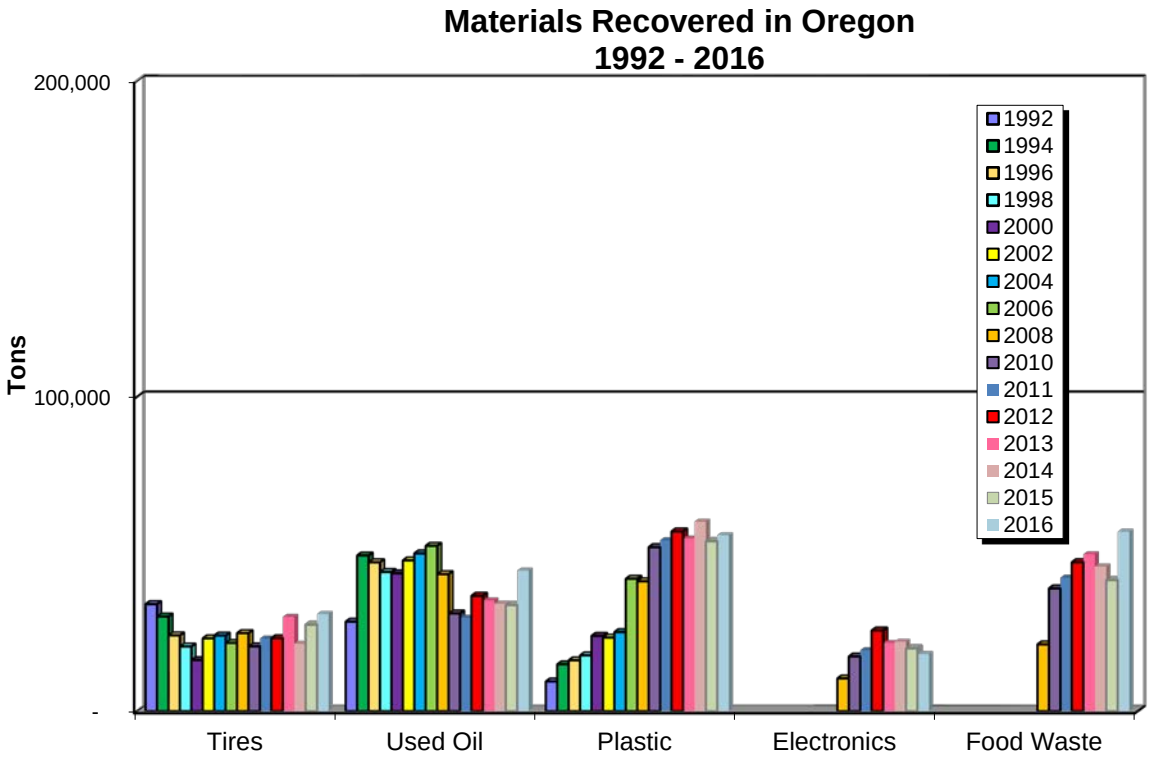
Glass. Glass decreased nearly three percent in 2016 as compared to 2015.

Electronics. Electronics recovery showed a decrease of nearly 13 percent in 2016 as compared to 2015. This is partly due to the average weight per unit recycled being less, particularly as the large cathode ray tube type monitors disappear from the recycling stream, but most likely due in part to fewer units being recycled since the peak in 2012.

Organics. Total recovery of organics (which includes wood waste, yard debris, food waste and animal waste/grease) decreased by more than eight percent in 2016; this could primarily be due to a lack in markets forcing much of the wood waste to be disposed in 2016 and subsequent years.

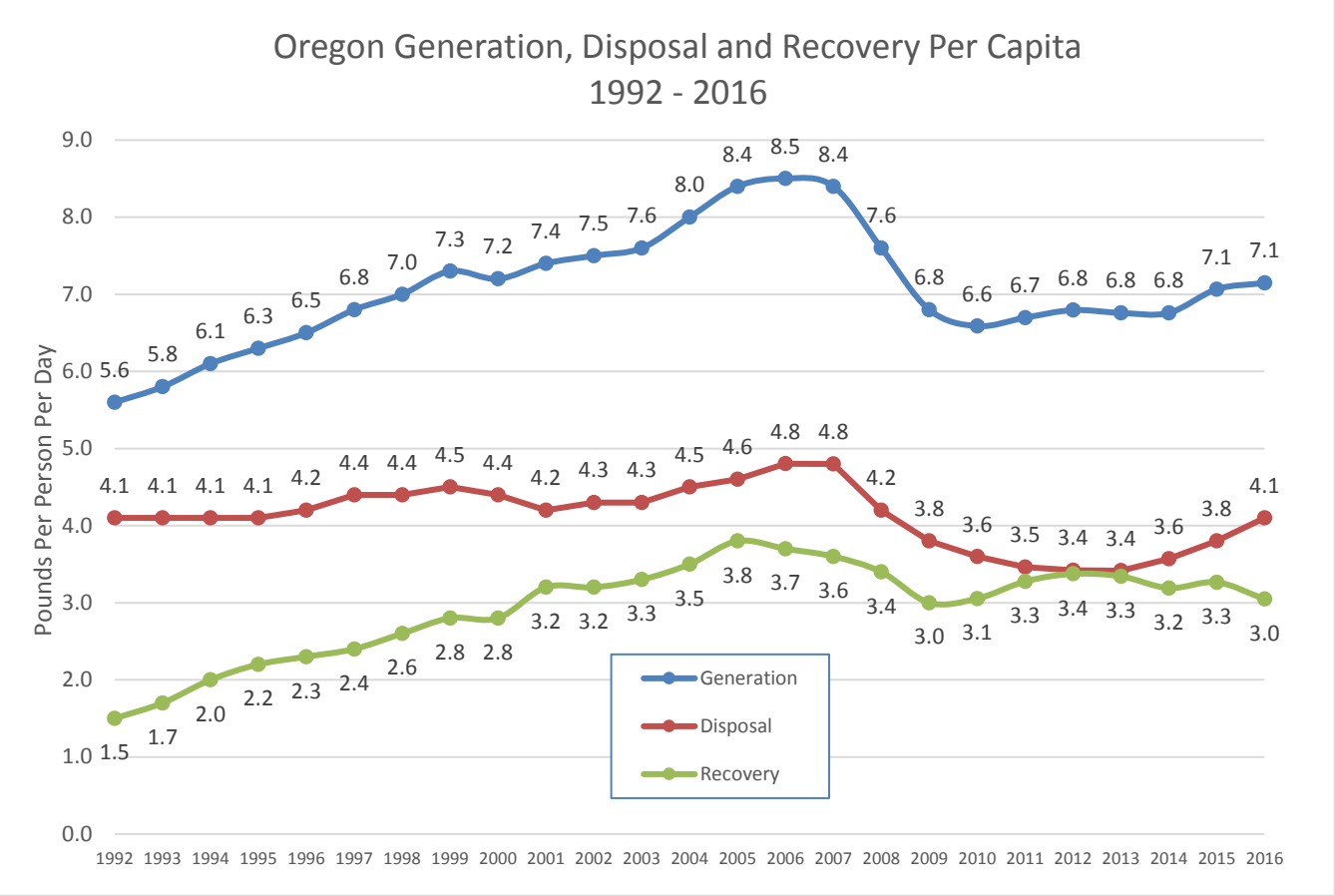
The following charts compare the materials recovered over the past 24 years.





Waste Generation

Changes in the total amount of municipal solid waste generated (materials recovered plus waste disposed) in Oregon over time tell an interesting story. From 1992 to 2006, total waste generation increased every year, often steeply. Waste generation then declined slightly in 2007 and sharply in both 2008 and 2009, coinciding with the economic recession. Between 2009 and 2014, waste generation started growing again, but at a very slow pace, averaging less than one percent increase per year. In 2016 Oregon generated 5,316,989 tons of municipal solid waste, an increase of nearly three percent over 2015. This equates to per-capita generation of 2,609 pounds per person (7.1 pounds per day), a 1.2 percent increase from 2,579 pounds per person (7.1 pounds per day) in 2015. In 2016, the state missed both its goals for no increase in per-capita and total waste generation. Still, total waste generation in 2016 was well below (412,890 tons less) its peak in 2006. This is a drop of 7.2 percent in total waste generation between 2006 and 2016, or nearly a 16 percent drop in the per-capita amount.



Generation is a crude measure of consumption, and for many materials, the environmental impacts of production (the corollary of consumption) are many times higher than the impacts of disposal. For example, EPA has estimated that roughly 40 percent of the country's greenhouse gas emissions are associated with the production and transportation of goods[2]. The leveling off of waste generation in 2006, the sharp decline in 2007 through 2009, and lack of restoration to pre-recession levels since then suggests that some of the changes in waste generation that occurred during the last recession may be long-lasting, and that the reduction in use of materials is not temporary. Reduction in materials use would, in turn, likely result in a reduction of greenhouse gas emissions

[2] Figure ES-1of *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices.* US Environmental Protection Agency, Sept. 2009.

associated with all stages of the life cycle of materials. Many other adverse environmental impacts associated with materials likely also decreased.

The following table shows the disposition of the municipal solid waste generated in Oregon in 2016. See Table 9 for individual wasteshed dispositions.

Disposition of Waste Generated in Oregon in 2016	
Disposition	**Percent by weight**
Disposed*	57.4
Recycled	26.7
Composted	10.3
Recovered for Energy*	5.6

*For the Marion County's waste-to-energy facility only the portion of waste that counts toward the county's and state's recovery rates is included here in "recovered for energy" (see Marion County Adjustments on page 13). Other wastes burned at the facility are counted here as disposed.

Conclusion

The energy savings and greenhouse gas reductions from materials recovered for recycling, composting and energy recovery in 2016 were significant. Energy savings were comparable to 216 million gallons of gasoline or roughly 2.8 percent of Oregon's total 2016 energy use. Reductions in greenhouse gas emissions were estimated at 2.9 million metric tons of CO2 equivalents or 4.7 percent of net statewide emissions from all sources in 2016. Recycling produced most of these benefits.

Reducing the generation of waste in the first place can achieve even greater greenhouse gas and energy benefits than material recovery. Unfortunately, overall waste generation in 2016 increased. This likely indicates an overall increase in the use (and production) of materials, with associated increases in emissions across all stages of their life cycle.

In 2015, Oregon adopted new statutory goals of 52 percent recovery by 2020 and 55 percent by 2025. At the time these goals were adopted, we did not anticipate that the largest mills in Oregon that burned wood waste as fuel would either close or discontinue burning recovered wood waste by the end of the year, resulting in a large drop in recovery and big increases in disposal of wood waste in 2016. Parallel to this report's publication (November 2017), Oregon and the world are also seeing major disruptions in the markets for most plastics and for mixed paper, as China, the largest importer of recycled feedstocks in the world, has restricted the importation of these materials and proposed banning the importation of mixed paper and all post-consumer plastics by 2018. Oregon recovered 2,266,556 tons of material for recycling, composting and energy recovery in 2016, giving a recovery rate of 42.6 percent, substantially below the 46.2 percent rate in 2015 and the peak 49.7 percent in 2012. Other anticipated changes in products and packaging are likely to make it even harder to achieve the state's goals in 2020 and 2025, as products and packaging become increasingly difficult to recycle due to such factors as substituting light-weight non-recyclable packaging for heavier recyclable packaging. Although these changes may make achieving a weight-based recovery goal more difficult, they can often lead to environmental benefits since less material is needed for the packaging, resulting in less energy use and greenhouse gases produced and even less solid waste generated and disposed.

A total of 3,050,432 tons of municipal post-consumer waste from Oregon was disposed in 2016, up 9.6 percent from 2015. Per-capita disposal also increased, but is still lower than it was in 1992 by just over one percent.

Total tons disposed added to total tons recovered equaled 5,316,989 tons of total waste generated in Oregon in 2016. Total generation increased by nearly three percent, while per capita generation increased slightly over one percent; missing the state goals of no increase in total generation and no increase in per-capita generation. Still, the amount of waste generated in 2016 was nearly 413,000 tons or over seven percent less than the waste generated in the peak year of 2006.

Adjustments to Reports from Previous Years

DEQ continues to review and use survey data even after publishing the final report each year. Occasionally, we encounter and correct errors in previously reported results. Thus, tonnages published in this report for previous years may not match the tonnages originally reported for that year.

DEQ made the following adjustments for the 2016 report:

- A correction to recovered tonnage of yard waste was made to the 2015 survey period, a reporting facility for 2016 sent in a missing 2015 report.
- A correction was made to some "plastic other" and "plastic film" incorrectly converted to tons from pounds, this increased the total recovered for both materials.
- A couple of revised disposal reports for 2015 were made. This adjustment increased disposal tonnage for 2015; which dropped the state recovery rate from 46.5 percent to 46.2 percent for 2015.

DEQ corrected data in previous years, for the following reasons:

- A correction to recovered tonnage of wood waste in two wastesheds was made to survey years 2014 and 2013, as some tonnage was determined to be pre-consumer material.
- Adjustments were made to 2014 and 2013 animal waste/grease collection amounts, as well as correctly identifying wastesheds of origin, based on revised reporting by an end-user.
- Disposal tonnage was reported for the wrong wasteshed. This adjustment increased disposal tonnage for 2014 for one wasteshed; which changed the wasteshed rate of the two wastesheds involved. This did not affect the state's recovery rate.
- An error in reporting was discovered by one of the recycling processors; a large amount of newspaper was double counted in the previously published 2004 results. The paper was counted both at the processing facility and at the paper mill.
- An enforcement action carried out by Metro showed that most of the brick reported as being recycled by one facility was falsely reported. DEQ subsequently decided that brick more closely resembled other inert materials such as cement and asphalt. Since these are not counted toward the recovery rate, brick was removed from all previous recovery tonnages.
- New information showed that corrections needed to be made to tonnages for roofing and non-container glass in 2003 and 2004, as well as other minor adjustments in other categories.
- Field visits showed that some plastic for 2005 had been reported as 'Plastic Other' and that this material was actually 'Rigid Plastic Containers.' The 2005 numbers have been adjusted for this change, along with a few other minor adjustments.
- Field visits and continued investigation showed that previously reported 'Wood Waste' collections for 2006 were actually collected in three years – 2004, 2005 and 2006. These years are now correct.
- The 2006 and 2007 plastics numbers were adjusted between grades of "Rigid Plastic Containers," "Plastic Other," and "Plastic Film." This may have led to small changes in the recovered tonnages for these materials.
- Investigation of disposal numbers at two landfills led to deductions in the amount of SW disposed – these were really Industrial Waste, non-counting for the purposes of this survey.
- Some changes were made in 2006 and 2007 to disposition of materials. Changes were made to composted, burned for energy recovery and disposed amounts.
- Adjustments were made to the 2007 collection amounts, correctly identifying the wasteshed of origin.

- For 2006 and 2007, some non-counting slaughterhouse material was deleted from the recovered tonnage.
- Sawdust material from manufacturing was deleted for 2006 and 2007.
- Beginning with 2006, material previously identified as "CD – Construction and Demolition" was separated out into individual materials.
- Textiles previously counted were determined to be re-used, which does not count for recovery. 2006, 2007, 2010 and 2011 recovered tonnage was decreased.
- Some gypsum sent for disposal was included in the 2006 and 2007 tonnage – this was removed.
- Bottle bill materials, container glass and aluminum had better reporting for 2009, and DEQ made some adjustments to those materials for 2008.
- Municipal solid wastes from another landfill were determined to be industrial and were deleted from the 2007 and 2008 counting tonnages.
- Minor disposal adjustments were made to two wastesheds for 2006 data with incorrectly reported county of origin.
- Yard debris numbers contained a large double counting for the Metro region – the correction caused a decrease in recovered tons
- Some roofing material was deleted - it was determined to be industrial material
- Added in disposal tonnages for 2009 and 2010 for material sent out of state for disposal.
- Corrected the disposition methods for food waste and yard debris in 2011.
- Fixed the disposal tonnages originally recorded for the incorrect wasteshed in 2011.
- An error in food waste reporting discovered by DEQ showed a large amount of food waste was double counted in the 2011 and 2012 reports. The food waste was counted both by the composting facility and by the recycling collectors.
- More accurate reporting identified corrections needed in tonnages for used oil, antifreeze, solvents and used oil filters in 2011 and 2012.
- Adjustments were made to 2013 and 2012 collection amounts, as well as correctly identifying wastesheds of origin.
- Municipal solid waste from one landfill was reported incorrectly as out-of-state waste, this adjustment increased the "counting" disposal tonnage for 2013. This in turn adjusted the state recovery rate from 54 percent for 2013 to 53.4 percent.

2016 Survey Report Tables

List of data tables one through nine used for this report.

Table 1: Wasteshed Recovery Rates, 2016

Wasteshed	Tons Disposed	Tons Recovered	Tons Generated	Calculated Recovery Rate[1]	SB 263 Goal[3] 2025
Baker	12,432.0	3,111.1	15,543.1	**20.0%**	25%
Benton	61,999.2	34,315.5	96,314.7	**35.6%**	44%
Clatsop	34,075.9	20,675.4	54,751.3	**37.8%**	53%
Columbia	28,656.7	13,817.5	42,474.1	**32.5%**	45%
Coos	45,444.8	13,219.8	58,664.6	**22.5%**	30%
Crook	20,339.8	5,302.2	25,641.9	**20.7%**	20%
Curry	19,222.1	7,001.0	26,223.0	**26.7%**	30%
Deschutes	161,087.5	79,756.9	240,844.3	**33.1%**	45%
Douglas	75,053.9	27,838.1	102,892.0	**27.1%**	34%
Gilliam	2,247.4	349.0	2,596.4	**13.4%**	25%
Grant	3,867.8	1,456.7	5,324.4	**27.4%**	25%
Harney	4,035.6	1,156.0	5,191.6	**22.3%**	25%
Hood River	20,187.3	7,471.7	27,659.0	**27.0%**	35%
Jackson	175,856.0	110,488.0	286,344.0	**38.6%**	25%
Jefferson	13,348.2	6,165.8	19,514.0	**31.6%**	32%
Josephine	70,075.9	38,486.3	108,562.2	**35.5%**	20%
Klamath	58,111.8	20,064.7	78,176.5	**25.7%**	20%
Lake	6,496.3	897.4	7,393.7	**12.1%**	15%
Lane	258,040.7	258,369.6	516,410.3	**50.0%**	63%
Lincoln	47,700.4	17,013.1	64,713.5	**26.3%**	37%
Linn	97,379.1	60,103.2	157,482.3	**38.2%**	45%
Malheur	22,204.6	7,976.8	30,181.4	**26.4%**	25%
Marion[2]	243,107.4	237,151.7	480,259.2	**49.4%**	64%
Metro	1,259,663.4	1,153,153.3	2,412,816.8	**47.8%**	64%
Milton-Freewater	4,670.2	1,809.2	6,479.4	**27.9%**	25%
Morrow	17,477.5	5,455.1	22,932.6	**23.8%**	20%
Polk	46,532.8	39,520.3	86,053.1	**45.9%**	48%
Sherman	1,219.2	158.4	1,377.5	**11.5%**	20%
Tillamook	26,403.4	9,331.5	35,734.9	**26.1%**	37%
Umatilla	72,808.0	26,966.3	99,774.3	**27.0%**	20%
Union	20,625.1	6,915.5	27,540.6	**25.1%**	25%
Wallowa	4,091.3	1,513.4	5,604.7	**27.0%**	25%
Wasco	19,418.5	6,900.0	26,318.5	**26.2%**	35%
Wheeler	371.4	57.4	428.8	**13.4%**	20%
Yamhill	96,181.1	42,588.4	138,769.6	**30.7%**	45%
OR Totals	3,050,432	2,266,556	5,316,989	**42.6%**	

[1] The recovery rate is calculated using the following formula:
1) Tons Disposed + Tons Recovered = Total Tons Generated
2) Tons Recovered / Total Generated = Calculated Recovery Rate

[2] The Marion County disposal and recovery rates reflect 12,481.54 tons of recyclable materials burned for energy in 2016
(per ORS 459A.010(3)(f)(B)).

Table 2: Amount Recovered in 2016 by Wasteshed

Wasteshed	2016 Tons Recovered	2016 Pounds Per Capita	2016 Wasteshed Population
Baker	3,111	377	16,510
Benton	34,316	820	83,673
Clatsop	20,675	1,082	38,225
Columbia	13,817	544	50,795
Coos	13,220	418	63,190
Crook	5,302	491	21,580
Curry	7,001	620	22,600
Deschutes	79,757	903	176,635
Douglas	27,838	504	110,395
Gilliam	349	353	1,980
Grant	1,457	393	7,410
Harney	1,156	316	7,320
Hood River	7,472	604	24,735
Jackson	110,488	1,034	213,765
Jefferson	6,166	541	22,790
Josephine	38,486	909	84,675
Klamath	20,065	595	67,410
Lake	897	224	8,015
Lane	258,370	1,412	365,940
Lincoln	17,013	713	47,735
Linn	60,103	924	130,158
Malheur	7,977	503	31,705
Marion*	237,152	1,421	333,754
Metro	1,153,153	1,296	1,779,245
Milton-Freewater	1,809	453	7,988
Morrow	5,455	929	11,745
Polk	39,520	1,002	78,861
Sherman	158	176	1,795
Tillamook	9,331	720	25,920
Umatilla	26,966	750	71,892
Union	6,916	517	26,745
Wallowa	1,513	424	7,140
Wasco	6,900	517	26,700
Wheeler	57	78	1,465
Yamhill	42,588	805	105,859
OREGON TOTALS	**2,266,556**	**1,112**	**4,076,350**

Source for population data is the Center for Population Research and Census, Portland State University, published April 2017. Wastesheds populations are not the same as County populations for the Wastesheds of Benton, Linn, Marion, Metro, Milton-Freewater, Polk, Umatilla, and Yamhill (see OAR 340-090-0050).

*Includes certain Marion County recyclable materials burned for energy (per ORS 459A.010(3)(f)(B)).

Table 3: Solid Waste Disposed in 2016 by Wasteshed

Wasteshed	2016 Tons Disposed	2016 Pounds Per Capita	2016 Wasteshed Population
Baker	12,432	1,506	16,510
Benton	61,999	1,482	83,673
Clatsop	34,076	1,783	38,225
Columbia	28,657	1,128	50,795
Coos	45,445	1,438	63,190
Crook	20,340	1,885	21,580
Curry	19,222	1,701	22,600
Deschutes	161,087	1,824	176,635
Douglas	75,054	1,360	110,395
Gilliam	2,247	2,270	1,980
Grant	3,868	1,044	7,410
Harney	4,036	1,103	7,320
Hood River	20,187	1,632	24,735
Jackson	175,856	1,645	213,765
Jefferson	13,348	1,171	22,790
Josephine	70,076	1,655	84,675
Klamath	58,112	1,724	67,410
Lake	6,496	1,621	8,015
Lane	258,041	1,410	365,940
Lincoln	47,700	1,999	47,735
Linn	97,379	1,496	130,158
Malheur	22,205	1,401	31,705
Marion*	243,107	1,457	333,754
Metro	1,259,663	1,416	1,779,245
Milton-Freewater	4,670	1,169	7,988
Morrow	17,477	2,976	11,745
Polk	46,533	1,180	78,861
Sherman	1,219	1,358	1,795
Tillamook	26,403	2,037	25,920
Umatilla	72,808	2,025	71,892
Union	20,625	1,542	26,745
Wallowa	4,091	1,146	7,140
Wasco	19,419	1,455	26,700
Wheeler	371	507	1,465
Yamhill	96,181	1,817	105,859
OREGON TOTALS	**3,050,432**	**1,497**	**4,076,350**

Source for population data is the Center for Population Research and Census, Portland State University, published April 2017. Wastesheds populations are not the same as County populations for the Wastesheds of Benton, Linn, Marion, Metro, Milton-Freewater, Polk, Umatilla, and Yamhill (see OAR 340-090-0050).

*Excludes certain Marion County recyclable materials burned for energy recovery (per ORS 459A.010(3)(f)(B)).

Table 4: Oregon Calculated Recovery Rates by Wasteshed, 1992-2016

Wasteshed	1992 Rate	1993 Rate	1994 Rate	1995 Rate	1996 Rate	1997 Calc. Rate*	1998 Calc. Rate*	1999 Calc. Rate*	2000 Calc. Rate*	2001 Calc. Rate*	2002 Calc. Rate*	2003 Calc. Rate*	2004 Calc. Rate*	2005 Calc. Rate*	2006 Calc. Rate*	2007 Calc. Rate*	2008 Calc. Rate*	2009 Calc. Rate*	2010 Calc. Rate*	2011 Calc. Rate*	2012 Calc. Rate*	2013 Calc. Rate*	2014 Calc. Rate*	2015 Calc. Rate*	2016 Calc. Rate*
Baker	10%	14%	17%	22%	25%	19%	19%	18%	18%	24%	21%	22%	20%	23%	17%	22%	21%	26%	22%	22%	23%	23%	28%	26%	20%
Benton	27%	30%	36%	35%	37%	41%	41%	35%	35%	41%	41%	39%	43%	40%	36%	39%	41%	38%	38%	38%	41%	41%	37%	35%	36%
Clatsop	19%	22%	20%	19%	20%	23%	22%	24%	25%	28%	25%	29%	31%	39%	34%	34%	36%	36%	36%	39%	40%	44%	38%	39%	38%
Columbia	34%	28%	22%	27%	22%	28%	29%	25%	31%	38%	34%	38%	31%	32%	30%	28%	30%	32%	36%	35%	33%	35%	29%	31%	33%
Coos	21%	20%	23%	28%	29%	28%	27%	22%	23%	23%	26%	21%	21%	23%	21%	20%	22%	23%	35%	48%	44%	40%	38%	24%	23%
Crook	16%	23%	19%	30%	23%	15%	14%	23%	27%	37%	27%	14%	21%	21%	26%	25%	33%	32%	34%	31%	35%	31%	26%	21%	21%
Curry	21%	25%	27%	31%	35%	33%	29%	27%	41%	39%	36%	25%	25%	15%	18%	24%	21%	20%	20%	27%	25%	23%	27%	24%	27%
Deschutes	15%	18%	24%	22%	23%	25%	32%	25%	31%	29%	27%	28%	27%	28%	27%	30%	31%	39%	35%	39%	39%	38%	36%	37%	33%
Douglas	26%	23%	23%	24%	26%	29%	30%	26%	26%	30%	29%	29%	31%	25%	24%	26%	34%	29%	36%	43%	41%	37%	33%	30%	27%
Gilliam	17%	6%	15%	20%	19%	21%	18%	15%	14%	13%	20%	10%	11%	7%	8%	13%	14%	27%	21%	18%	44%	42%	18%	35%	13%
Grant	18%	14%	16%	19%	16%	15%	16%	18%	19%	19%	18%	16%	19%	28%	21%	24%	25%	22%	22%	25%	22%	29%	18%	24%	27%
Harney	18%	21%	20%	34%	24%	21%	34%	34%	20%	27%	28%	27%	21%	27%	28%	25%	34%	24%	26%	31%	28%	27%	28%	22%	22%
Hood River	16%	24%	26%	16%	17%	17%	17%	19%	18%	30%	34%	35%	37%	36%	33%	30%	28%	29%	26%	34%	31%	32%	28%	29%	27%
Jackson	15%	19%	35%	33%	34%	34%	34%	29%	28%	32%	36%	32%	31%	32%	34%	30%	32%	36%	42%	42%	43%	43%	41%	37%	39%
Jefferson	21%	16%	18%	22%	24%	33%	33%	21%	27%	27%	21%	23%	34%	33%	28%	36%	34%	31%	41%	47%	45%	42%	33%	25%	32%
Josephine	14%	19%	27%	34%	38%	37%	41%	42%	33%	34%	37%	35%	37%	37%	39%	34%	39%	38%	40%	49%	50%	46%	40%	34%	35%
Klamath	13%	12%	17%	18%	15%	16%	17%	15%	18%	31%	30%	23%	31%	37%	34%	35%	45%	33%	29%	28%	33%	30%	31%	22%	26%
Lake	6%	6%	9%	8%	7%	6%	8%	11%	8%	11%	11%	25%	25%	15%	19%	22%	35%	25%	27%	29%	27%	26%	17%	12%	12%
Lane	19%	28%	32%	32%	39%	39%	40%	41%	46%	46%	44%	46%	45%	48%	47%	46%	46%	46%	51%	56%	55%	51%	53%	50%	50%
Lincoln	20%	20%	21%	19%	16%	19%	20%	19%	23%	28%	27%	28%	29%	33%	26%	28%	31%	29%	33%	32%	36%	29%	32%	31%	26%
Linn	15%	27%	29%	30%	32%	33%	31%	33%	29%	34%	38%	34%	44%	43%	41%	37%	41%	40%	44%	49%	45%	44%	42%	39%	38%
Malheur	19%	15%	12%	15%	20%	19%	22%	24%	25%	26%	27%	26%	27%	25%	23%	23%	22%	19%	23%	21%	27%	28%	25%	24%	26%
Marion	26%	27%	27%	29%	28%	28%	30%	32%	38%	**50%	**51%	**47%	**47%	**50%	**52%	**50%	**52%	**52%	**50%	**55%	**54%	**55%	**54%	**52%	**49%
Metro	35%	37%	39%	42%	41%	42%	43%	43%	45%	49%	47%	50%	51%	53%	50%	49%	50%	50%	52%	53%	56%	57%	54%	53%	48%
Milton-Freewater	16%	13%	13%	22%	21%	20%	19%	18%	21%	21%	24%	25%	24%	30%	33%	31%	43%	35%	35%	38%	27%	41%	39%	40%	28%
Morrow	11%	16%	13%	12%	13%	17%	17%	20%	15%	16%	16%	20%	20%	14%	21%	26%	25%	23%	22%	23%	25%	18%	21%	21%	24%
Polk	20%	25%	24%	23%	19%	24%	26%	29%	33%	39%	38%	43%	44%	50%	48%	46%	47%	46%	46%	48%	44%	44%	46%	45%	46%
Sherman	24%	17%	20%	20%	21%	11%	16%	24%	17%	15%	14%	16%	26%	16%	19%	16%	15%	14%	11%	14%	22%	14%	16%	16%	11%
Tillamook	31%	27%	28%	27%	26%	26%	26%	28%	26%	28%	28%	27%	39%	37%	33%	31%	32%	29%	31%	34%	33%	32%	30%	29%	26%
Umatilla	14%	15%	15%	19%	20%	25%	24%	25%	26%	28%	35%	33%	36%	36%	35%	36%	38%	32%	29%	29%	31%	29%	28%	29%	27%
Union	16%	19%	21%	30%	26%	29%	27%	24%	22%	22%	28%	26%	27%	27%	34%	32%	30%	29%	29%	31%	30%	30%	25%	25%	25%
Wallowa	6%	8%	11%	18%	11%	16%	16%	19%	21%	19%	19%	16%	18%	19%	22%	27%	24%	23%	19%	23%	22%	24%	27%	22%	27%
Wasco	25%	23%	26%	29%	30%	29%	31%	34%	34%	26%	28%	31%	25%	24%	19%	23%	23%	33%	28%	31%	28%	32%	28%	28%	26%
Wheeler	7%	8%	11%	24%	20%	20%	25%	18%	14%	13%	25%	27%	16%	34%	24%	27%	27%	20%	8%	13%	9%	9%	7%	16%	13%
Yamhill	19%	22%	25%	30%	35%	25%	31%	36%	44%	49%	54%	42%	50%	45%	39%	36%	36%	40%	34%	40%	33%	38%	37%	42%	31%
OREGON TOTALS	**27.1%**	**29.9%**	**32.6%**	**34.7%**	**34.9%**	**35.7%**	**37.3%**	**36.8%**	**38.9%**	**43.1%**	**42.7%**	**43.1%**	**44.2%**	**45.5%**	**43.5%**	**42.9%**	**44.6%**	**44.6%**	**45.9%**	**48.6%**	**49.7%**	**49.5%**	**47.2%**	**46.2%**	**42.6%**

*does not include 2% credits
**does include certain Marion County recyclable materials burned for energy

Table 5: Oregon Amount Recovered by Wasteshed, 1992-2016

Wasteshed	1992 Rvd (tons)	Per Capita (lbs.)	1996 Rvd (tons)	2001 Rvd (tons)	Per Capita (lbs.)	2006 Rvd (tons)	Per Capita (lbs.)	2008 Rvd (tons)	Per Capita (lbs.)	2010 Rvd (tons)	Per Capita (lbs.)	2011 Rvd (tons)	Per Capita (lbs.)	2012 Rvd (tons)	Per Capita (lbs.)	2013 Rvd (tons)	Per Capita (lbs.)	2014 Rvd (tons)	Per Capita (lbs.)	2015 Rvd (tons)	Per Capita (lbs.)	2016 Rvd (tons)	Per Capita (lbs.)	Change in Per Capita 2016-15
Baker	982	124	3,644	3,488	418	2,782	338	3,366	409	3,793	469	3,402	420	3,200	395	3,325	408	4,071	499	4,122	502	3,111	377	-24.9%
Benton	21,480	626	30,352	35,609	966	35,728	921	38,210	966	32,938	832	33,775	852	38,226	955	37,953	939	33,959	832	33,394	807	34,316	820	1.6%
Clatsop	5,148	300	7,118	11,999	669	19,576	1,057	20,984	1,113	17,440	941	18,366	989	19,465	1,047	23,013	1,235	19,025	1,015	20,978	1,111	20,675	1,082	-2.7%
Columbia	7,894	407	6,258	14,050	634	12,940	551	12,968	539	13,729	555	13,386	539	12,703	511	13,254	532	10,273	410	11,787	468	13,817	544	16.3%
Coos	10,035	323	14,972	11,075	352	13,364	425	13,529	428	22,551	716	36,368	1,155	31,613	1,005	27,146	864	26,190	833	13,024	414	13,220	418	1.2%
Crook	1,581	206	3,156	7,040	709	7,075	577	7,871	586	7,006	667	7,535	723	6,328	613	6,182	598	5,209	501	4,459	423	5,302	491	16.2%
Curry	2,863	288	6,011	9,464	878	4,830	452	5,161	480	4,349	389	6,235	558	5,557	499	4,798	430	5,748	514	5,424	483	7,001	620	28.3%
Deschutes	12,858	305	30,222	49,459	810	69,443	910	64,276	770	62,077	786	72,635	914	72,065	900	74,062	911	72,965	877	83,271	975	79,757	903	-7.4%
Douglas	29,467	614	30,945	38,983	770	31,980	616	44,082	838	41,949	779	55,220	1,025	50,342	931	42,333	778	36,263	663	32,335	588	27,838	504	-14.3%
Gilliam	177	205	284	252	265	225	239	370	393	596	637	462	491	1,684	1,773	1,395	1,434	488	495	1,070	1,084	349	353	-67.5%
Grant	911	232	687	897	230	1,055	277	1,325	352	1,105	296	1,338	359	954	256	1,386	373	838	226	1,235	332	1,457	393	18.3%
Harney	600	171	678	1,076	283	1,165	304	1,573	408	1,122	301	1,327	360	1,414	387	1,307	360	1,360	374	1,084	297	1,156	316	6.3%
Hood River	1,855	212	3,333	6,517	633	9,200	862	7,479	692	6,404	572	9,541	843	7,785	681	7,847	674	6,701	565	7,783	642	7,472	604	-5.9%
Jackson	17,134	221	60,292	71,666	776	92,807	935	76,330	744	102,539	1,009	99,579	977	108,893	1,064	105,705	1,025	108,992	1,046	97,326	923	110,488	1,034	12.0%
Jefferson	1,269	170	2,667	3,963	409	5,506	514	6,217	554	7,300	671	8,641	791	8,244	752	7,305	663	5,400	486	4,046	361	6,166	541	50.1%
Josephine	7,826	239	21,688	25,556	665	42,005	1,036	35,957	863	32,992	797	47,045	1,136	48,567	1,173	43,614	1,053	39,387	948	32,725	782	38,486	909	16.3%
Klamath	8,827	301	11,171	21,617	673	36,650	1,120	48,819	1,475	20,571	619	20,751	623	23,432	702	19,793	593	22,134	662	15,183	452	20,065	595	31.6%
Lake	269	74	601	643	171	1,360	361	2,950	778	2,215	561	2,656	674	1,843	465	2,177	548	1,145	287	847	211	897	224	5.9%
Lane	72,072	493	153,843	206,010	1,264	248,599	1,463	217,537	1,258	237,493	1,349	269,100	1,524	268,429	1,516	229,818	1,291	264,472	1,474	242,830	1,341	258,370	1,412	5.3%
Lincoln	6,886	338	7,823	15,128	678	18,030	810	21,355	955	18,810	815	18,520	803	22,104	955	16,915	727	19,940	850	19,827	840	17,013	713	-15.1%
Linn	17,232	352	33,201	36,510	670	60,754	1,057	54,219	924	62,832	1,016	76,150	1,226	65,299	1,045	61,833	983	60,159	947	59,426	926	60,103	924	-0.3%
Malheur	3,283	237	4,808	7,204	450	6,862	433	6,437	406	6,289	401	5,309	338	7,470	476	7,699	490	6,621	421	6,703	426	7,977	503	18.2%
Marion	55,834	462	85,731	191,817	1,331	264,168	1,724	239,441	1,522	206,398	1,308	235,584	1,482	228,708	1,428	232,540	1,441	238,422	1,463	240,595	1,460	237,152	1,421	-2.7%
Metro	514,747	825	752,470	1,097,409	1,496	1,337,848	1,705	1,234,180	1,529	1,110,443	1,350	1,122,542	1,355	1,222,024	1,461	1,278,987	1,510	1,182,294	1,377	1,301,253	1,491	1,153,153	1,296	-13.1%
Milton-Freew.	908	323	1,186	1,344	410	2,612	793	3,598	994	2,346	617	2,567	670	1,615	419	3,103	797	2,674	683	2,846	719	1,809	453	-37.0%
Morrow	930	227	842	1,364	245	2,874	474	3,868	620	3,020	541	3,269	580	3,680	651	2,944	515	4,047	702	4,466	768	5,455	929	21.0%
Polk	4,873	187	6,787	22,550	717	38,074	1,155	34,828	1,032	33,134	888	34,439	917	30,505	805	29,953	786	34,580	899	35,114	904	39,520	1,002	10.9%
Sherman	270	278	264	234	246	232	249	256	278	154	174	194	220	319	362	181	203	219	246	251	281	158	176	-37.2%
Tillamook	4,518	406	5,246	7,113	578	12,554	983	11,994	921	10,159	804	10,407	824	10,606	838	9,698	764	9,078	713	9,424	734	9,331	720	-1.9%
Umatilla	6,641	236	12,454	23,097	718	35,495	1,082	40,616	1,247	27,461	803	27,610	801	28,990	835	26,066	744	26,990	766	29,813	837	26,966	750	-10.4%
Union	2,525	210	5,203	5,578	454	7,518	599	8,102	639	7,159	555	7,823	602	7,991	611	8,031	610	6,350	480	6,691	503	6,916	517	2.9%
Wallowa	433	119	503	1,045	294	1,431	401	1,339	376	719	205	954	273	923	263	1,058	300	904	256	1,122	316	1,513	424	34.1%
Wasco	5,443	485	7,519	6,240	517	5,131	426	6,545	542	7,089	562	7,682	607	6,688	525	8,158	632	7,062	541	6,863	520	6,900	517	-0.7%
Wheeler	59	82	185	67	86	161	206	166	211	38	52	62	86	37	52	45	63	29	40	77	107	57	78	-26.7%
Yamhill	11,850	338	26,116	63,021	1,447	64,017	1,386	50,200	1,056	49,737	992	45,653	907	43,787	864	51,237	1,002	43,277	837	54,726	1,048	42,588	805	-23.2%
OR. TOTALS	**839,679**	**562**	**1,338,259**	**1,999,085**	**1,152**	**2,494,050**	**1,352**	**2,326,146**	**1,227**	**2,163,957**	**1,128**	**2,306,124**	**1,196**	**2,391,490**	**1,232**	**2,390,859**	**1,220**	**2,307,269**	**1,164**	**2,392,117**	**1,192**	**2,266,556**	**1,112**	**-6.70%**
change in total from previous year			6.45%	13.21%		-1.16%		-4.57%		3.90%		6.57%		3.70%		-0.03%		-3.50%		3.68%		-5.25%		
change in per capita from previous year					12.06%		-2.74%		-5.72%		3.53%		6.01%		3.04%		-0.97%		-4.59%		2.40%		-6.70%	

Data from 1993-1995, 1997-2000, 2002-2005, 2007 and 2009 is not shown due to page formatting. Please contact DEQ directly for data from these years.

Certain recoverable materials in mixed waste burned at the waste-to-energy facility in Brooks are excluded from Marion County and Statewide recovery in years prior to 2001 but included in 2001 and subsequent years (per ORS 459A.010(3)(f)(B)).

Table 6: Oregon Solid Waste Disposed by Wasteshed, 1992-2016

Wasteshed	1992 Disposed (tons)	Per Capita (lbs.)	1996 Disposed (tons)	Per Capita (lbs.)	2001 Disposed (tons)	Per Capita (lbs.)	2006 Disposed (tons)	Per Capita (lbs.)	2008 Disposed (tons)	Per Capita (lbs.)	2010 Disposed (tons)	Per Capita (lbs.)	2011 Disposed (tons)	Per Capita (lbs.)	2012 Disposed (tons)	Per Capita (lbs.)	2013 Disposed (tons)	Per Capita (lbs.)	2014 Disposed (tons)	Per Capita (lbs.)	2015 Disposed (tons)	Per Capita (lbs.)	2016 Disposed (tons)	Per Capita (lbs.)	Change in Per Capita 2016-15
Baker	8,419	1,062	10,897	1,310	11,317	1,355	13,770	1,672	12,973	1,577	13,693	1,692	11,926	1,471	10,610	1,309	11,309	1,389	10,251	1,256	11,585	1,411	12,432	1,506	6.75%
Benton	58,761	1,713	50,840	1,390	51,577	1,399	62,940	1,622	54,675	1,382	52,945	1,338	54,525	1,375	54,062	1,351	53,516	1,324	57,050	1,398	61,331	1,483	61,999	1,482	-0.04%
Clatsop	22,263	1,299	28,671	1,623	31,318	1,747	38,125	2,058	36,529	1,938	31,036	1,674	29,266	1,576	29,291	1,575	28,969	1,555	31,314	1,670	32,170	1,704	34,076	1,783	4.61%
Columbia	15,131	780	22,650	1,095	23,197	1,047	29,541	1,258	30,412	1,265	24,616	996	24,614	992	25,400	1,023	24,970	1,002	25,697	1,026	26,130	1,037	28,657	1,128	8.80%
Coos	37,596	1,211	36,436	1,148	37,711	1,198	50,868	1,617	47,266	1,496	41,862	1,328	39,987	1,270	40,733	1,295	40,287	1,282	42,222	1,343	42,362	1,345	45,445	1,438	6.94%
Crook	8,378	1,091	10,646	1,224	11,872	1,196	20,566	1,677	15,827	1,179	13,860	1,319	16,415	1,574	11,978	1,160	14,082	1,361	14,736	1,418	16,902	1,603	20,340	1,885	17.58%
Curry	10,555	1,062	11,121	1,059	14,996	1,392	21,834	2,044	19,470	1,810	16,982	1,519	16,661	1,492	16,419	1,473	16,289	1,461	15,885	1,421	17,103	1,522	19,222	1,701	11.75%
Deschutes	72,529	1,720	103,397	2,070	120,334	1,972	188,146	2,466	142,400	1,705	115,030	1,457	112,751	1,419	113,611	1,419	119,682	1,473	130,956	1,574	144,067	1,688	161,087	1,824	8.08%
Douglas	85,040	1,772	87,325	1,751	90,379	1,786	103,061	1,985	84,164	1,599	75,047	1,394	73,716	1,368	72,583	1,342	70,763	1,300	74,219	1,357	74,436	1,354	75,054	1,360	0.39%
Gilliam	872	1,008	1,176	1,271	1,622	1,707	2,429	2,577	2,197	2,333	2,255	2,411	2,108	2,243	2,126	2,238	1,943	1,998	2,285	2,314	1,955	1,980	2,247	2,270	14.66%
Grant	4,178	1,063	3,492	869	3,790	972	3,918	1,027	3,944	1,048	3,896	1,044	4,010	1,076	3,473	932	3,421	920	3,730	1,005	3,809	1,025	3,868	1,044	1.82%
Harney	2,650	756	2,126	591	2,892	761	2,999	782	3,080	799	3,153	847	3,043	825	3,563	974	3,484	960	3,576	984	3,886	1,065	4,036	1,103	3.49%
Hood River	9,959	1,139	16,016	1,659	15,397	1,495	18,620	1,745	19,035	1,760	17,782	1,589	18,221	1,611	17,046	1,490	16,530	1,419	17,175	1,448	18,607	1,535	20,187	1,632	6.35%
Jackson	98,002	1,265	115,011	1,348	152,562	1,652	182,404	1,837	159,636	1,555	141,765	1,394	139,973	1,373	142,338	1,391	139,677	1,354	157,217	1,509	164,031	1,555	175,856	1,645	5.81%
Jefferson	4,813	645	8,380	965	10,929	1,127	14,385	1,344	12,243	1,091	10,387	955	9,714	889	10,148	925	10,250	930	10,883	980	12,394	1,104	13,348	1,171	6.07%
Josephine	47,687	1,457	35,873	992	50,436	1,313	66,105	1,630	56,445	1,355	49,268	1,190	49,130	1,186	48,812	1,179	51,156	1,235	58,277	1,402	62,132	1,484	70,076	1,655	11.51%
Klamath	57,247	1,950	66,874	2,153	48,182	1,501	72,315	2,210	58,740	1,775	49,933	1,502	53,361	1,603	47,284	1,417	46,506	1,392	49,603	1,483	52,858	1,575	58,112	1,724	9.45%
Lake	4,364	1,196	7,468	2,002	5,120	1,365	5,651	1,499	5,599	1,476	5,925	1,502	6,773	1,718	5,025	1,269	6,110	1,539	5,698	1,426	5,926	1,480	6,496	1,621	9.55%
Lane	302,695	2,072	239,310	1,542	240,984	1,479	281,347	1,656	251,260	1,453	225,988	1,284	215,728	1,222	222,486	1,256	221,532	1,244	233,477	1,301	239,016	1,320	258,041	1,410	6.84%
Lincoln	27,601	1,355	42,443	1,908	38,835	1,740	50,537	2,270	47,876	2,141	38,932	1,688	38,810	1,682	39,388	1,702	40,968	1,760	42,098	1,796	43,698	1,851	47,700	1,999	7.99%
Linn	94,644	1,931	69,506	1,328	70,471	1,294	89,163	1,551	76,961	1,312	80,589	1,303	78,919	1,270	79,746	1,276	78,590	1,249	81,869	1,289	91,837	1,431	97,379	1,496	4.54%
Malheur	13,815	996	18,776	1,246	20,995	1,312	23,292	1,468	23,008	1,453	20,713	1,322	20,176	1,283	19,920	1,269	20,043	1,275	20,201	1,284	20,956	1,331	22,205	1,401	5.20%
Marion	158,109	1,307	219,182	1,648	194,190	1,347	245,214	1,600	217,172	1,380	205,923	1,305	195,332	1,229	191,947	1,199	193,571	1,200	204,991	1,258	221,600	1,345	243,107	1,457	8.33%
Metro	945,634	1,516	1,097,246	1,613	1,151,339	1,569	1,356,955	1,730	1,223,706	1,516	1,029,314	1,252	977,769	1,180	946,915	1,132	963,041	1,137	1,022,371	1,190	1,136,448	1,302	1,259,663	1,416	8.73%
Milton-Freew.	4,642	1,649	4,332	1,431	5,024	1,532	5,349	1,625	4,770	1,318	4,303	1,132	4,051	1,058	4,367	1,133	4,429	1,137	4,189	1,069	4,242	1,072	4,670	1,169	9.09%
Morrow	7,221	1,763	5,883	1,264	7,394	1,326	10,506	1,733	11,749	1,882	10,734	1,921	10,885	1,932	10,976	1,943	13,146	2,301	15,285	2,653	16,661	2,865	17,477	2,976	3.87%
Polk	19,036	729	28,655	1,000	34,914	1,110	41,453	1,257	39,340	1,165	39,552	1,060	37,817	1,007	38,564	1,018	38,774	1,017	40,516	1,054	42,734	1,100	46,533	1,180	7.32%
Sherman	876	903	987	1,028	1,306	1,375	1,021	1,095	1,478	1,604	1,190	1,349	1,203	1,363	1,135	1,286	1,091	1,226	1,160	1,300	1,330	1,486	1,219	1,358	-8.61%
Tillamook	9,940	893	15,212	1,271	18,324	1,490	24,988	1,958	26,046	1,999	22,373	1,771	20,559	1,628	21,556	1,704	20,712	1,632	21,590	1,695	23,130	1,801	26,403	2,037	13.14%
Umatilla	41,059	1,461	51,388	1,709	59,854	1,861	65,980	2,011	66,601	2,045	66,345	1,940	67,354	1,955	64,341	1,854	65,129	1,858	69,030	1,958	71,374	2,004	72,808	2,025	1.08%
Union	12,866	1,069	14,676	1,181	20,051	1,633	14,801	1,179	19,055	1,503	17,841	1,382	17,785	1,369	18,237	1,393	18,425	1,400	18,872	1,425	20,289	1,524	20,625	1,542	1.20%
Wallowa	6,801	1,876	4,024	1,076	4,393	1,237	5,009	1,403	4,221	1,187	2,990	854	3,250	929	3,197	912	3,402	966	2,495	706	3,881	1,093	4,091	1,146	4.82%
Wasco	16,760	1,494	17,480	1,508	17,884	1,481	22,089	1,835	21,387	1,770	18,196	1,442	17,005	1,344	17,368	1,363	17,324	1,342	18,175	1,392	17,527	1,329	19,419	1,455	9.42%
Wheeler	758	1,053	763	930	461	595	512	655	446	567	427	593	417	582	384	540	468	655	368	511	418	579	371	507	-12.36%
Yamhill	52,199	1,490	48,909	1,241	65,022	1,493	99,934	2,163	90,790	1,910	95,662	1,908	64,513	1,281	89,805	1,771	83,241	1,628	73,473	1,422	76,900	1,472	96,181	1,817	23.44%
Rounding adj.																									
OR. TOTALS	**2,263,099**	**1,513**	**2,497,170**	**1,539**	**2,635,072**	**1,518**	**3,235,828**	**1,754**	**2,890,503**	**1,525**	**2,550,509**	**1,329**	**2,437,767**	**1,264**	**2,424,833**	**1,249**	**2,442,827**	**1,247**	**2,580,933**	**1,303**	**2,783,726**	**1,387**	**3,050,432**	**1,497**	**7.90%**
change in total from previous year			5.72%		-5.16%		6.92%		-11.01%		-1.40%		-4.42%		-0.53%		0.74%		5.65%		7.86%		9.58%		
change in per capita from previous year				3.68%		-6.12%		5.21%		-12.08%		-1.76%		-4.92%		-1.18%		-0.16%		4.49%		6.45%		7.90%	

Data from 1993-1995, 1997-2000, 2002-2005, 2007 and 2009 is not shown due to page formatting. Please contact DEQ directly for data from these years.

Certain recoverable materials in mixed waste burned at the waste-to-energy facility in Brooks are included in Marion County

Table 7: Oregon Solid Waste Generated by Wasteshed, 1992-2016

Wasteshed	1992 Generated (tons)	Per Capita (lbs.)	1996 Generated (tons)	Per Capita (lbs.)	2001 Generated (tons)	Per Capita (lbs.)	2006 Generated (tons)	Per Capita (lbs.)	2008 Generated (tons)	Per Capita (lbs.)	2010 Generated (tons)	Per Capita (lbs.)	2011 Generated (tons)	Per Capita (lbs.)	2012 Generated (tons)	Per Capita (lbs.)	2013 Generated (tons)	Per Capita (lbs.)	2014 Generated (tons)	Per Capita (lbs.)	2015 Generated (tons)	Per Capita (lbs.)	2016 Generated (tons)	Per Capita (lbs.)	Change in Per Capita 2015-16
Baker	9,401	1,186	14,540	1,748	14,805	1,773	16,552	2,010	16,339	1,986	17,486	2,161	15,328	1,891	13,810	1,704	14,634	1,798	14,322	1,755	15,707	1,913	15,543	1,883	-1.55%
Benton	80,241	2,339	81,192	2,220	87,186	2,365	98,668	2,543	92,885	2,347	85,883	2,170	88,300	2,227	92,288	2,307	91,469	2,264	91,009	2,231	94,724	2,290	96,315	2,302	0.54%
Clatsop	27,411	1,600	35,789	2,027	43,317	2,416	57,701	3,115	57,513	3,051	48,476	2,615	47,632	2,565	48,757	2,622	51,982	2,789	50,339	2,685	53,148	2,816	54,751	2,865	1.74%
Columbia	23,025	1,187	28,908	1,397	37,247	1,681	42,482	1,809	43,381	1,804	38,345	1,551	38,000	1,531	38,103	1,534	38,224	1,534	35,970	1,437	37,917	1,505	42,474	1,672	11.13%
Coos	47,631	1,534	51,409	1,620	48,786	1,550	64,232	2,042	60,794	1,924	64,414	2,044	76,354	2,425	72,346	2,301	67,432	2,145	68,412	2,175	55,386	1,759	58,665	1,857	5.58%
Crook	9,959	1,297	13,802	1,586	18,912	1,905	27,642	2,254	23,697	1,765	20,866	1,985	23,950	2,297	18,305	1,773	20,263	1,959	19,945	1,920	21,361	2,026	25,642	2,376	17.29%
Curry	13,418	1,350	17,132	1,632	24,460	2,270	26,663	2,496	24,631	2,290	21,332	1,908	22,896	2,050	21,977	1,971	21,087	1,891	21,633	1,935	22,526	2,005	26,223	2,321	15.74%
Deschutes	85,387	2,025	133,618	2,676	169,793	2,782	257,589	3,376	206,676	2,475	177,107	2,243	185,386	2,334	185,676	2,319	193,744	2,384	203,921	2,451	227,338	2,663	240,844	2,727	2.41%
Douglas	114,507	2,386	118,269	2,372	129,362	2,556	135,041	2,602	128,246	2,437	116,996	2,173	128,936	2,392	122,925	2,272	113,095	2,078	110,482	2,020	106,771	1,943	102,892	1,864	-4.06%
Gilliam	1,049	1,213	1,459	1,577	1,874	1,972	2,654	2,816	2,567	2,725	2,851	3,049	2,570	2,734	3,810	4,011	3,338	3,432	2,774	2,809	3,026	3,064	2,596	2,623	-14.40%
Grant	5,089	1,295	4,179	1,040	4,687	1,202	4,973	1,304	5,269	1,400	5,001	1,341	5,347	1,436	4,427	1,189	4,807	1,293	4,568	1,230	5,043	1,358	5,324	1,437	5.86%
Harney	3,249	927	2,804	779	3,968	1,044	4,163	1,086	4,653	1,208	4,274	1,148	4,370	1,185	4,977	1,361	4,791	1,320	4,936	1,359	4,970	1,363	5,192	1,418	4.09%
Hood River	11,814	1,352	19,349	2,004	21,914	2,128	27,820	2,608	26,514	2,452	24,186	2,161	27,761	2,454	24,831	2,171	24,377	2,093	23,876	2,012	26,389	2,177	27,659	2,236	2.73%
Jackson	115,135	1,486	175,303	2,054	224,228	2,428	275,210	2,771	235,967	2,299	244,304	2,403	239,552	2,349	251,230	2,455	245,382	2,379	266,209	2,555	261,357	2,478	286,344	2,679	8.13%
Jefferson	6,082	815	11,047	1,272	14,892	1,536	19,892	1,858	18,460	1,644	17,688	1,626	18,356	1,681	18,393	1,677	17,554	1,593	16,284	1,467	16,440	1,465	19,514	1,713	16.90%
Josephine	55,513	1,696	57,560	1,592	75,992	1,978	108,110	2,665	92,402	2,219	82,261	1,988	96,175	2,323	97,379	2,353	94,770	2,289	97,664	2,350	94,857	2,266	108,562	2,564	13.16%
Klamath	66,074	2,251	78,044	2,512	69,799	2,174	108,965	3,329	107,559	3,251	70,504	2,120	74,112	2,226	70,715	2,119	66,299	1,985	71,737	2,144	68,042	2,028	78,176	2,319	14.38%
Lake	4,633	1,269	8,069	2,163	5,763	1,536	7,011	1,860	8,549	2,254	8,140	2,063	9,428	2,391	6,868	1,734	8,287	2,087	6,844	1,713	6,773	1,691	7,394	1,845	9.10%
Lane	374,767	2,565	393,153	2,534	446,994	2,743	529,946	3,120	468,797	2,711	463,480	2,633	484,827	2,746	490,915	2,772	451,350	2,535	497,949	2,776	481,845	2,661	516,410	2,822	6.06%
Lincoln	34,487	1,693	50,266	2,259	53,963	2,418	68,566	3,080	69,231	3,097	57,742	2,503	57,331	2,484	61,492	2,657	57,883	2,486	62,038	2,646	63,525	2,690	64,713	2,711	0.78%
Linn	111,875	2,282	102,707	1,962	106,981	1,964	149,917	2,608	131,181	2,236	143,420	2,320	155,069	2,496	145,045	2,320	140,423	2,232	142,028	2,235	151,264	2,358	157,482	2,420	2.64%
Malheur	17,098	1,233	23,583	1,565	28,199	1,762	30,155	1,901	29,445	1,859	27,002	1,723	25,485	1,621	27,390	1,745	27,742	1,765	26,822	1,705	27,660	1,757	30,181	1,904	8.34%
Marion	213,943	1,768	304,913	2,293	386,007	2,678	509,383	3,324	456,613	2,902	412,321	2,612	430,916	2,711	420,655	2,627	426,111	2,641	443,413	2,721	462,195	2,805	480,259	2,878	2.61%
Metro	1,460,380	2,341	1,849,716	2,719	2,248,748	3,065	2,694,802	3,435	2,457,886	3,045	2,139,757	2,602	2,100,311	2,535	2,168,939	2,593	2,242,027	2,648	2,204,665	2,567	2,437,701	2,793	2,412,817	2,712	-2.90%
Milton-Freew.	5,551	1,972	5,518	1,823	6,368	1,942	7,961	2,418	8,368	2,312	6,648	1,750	6,618	1,728	5,982	1,551	7,533	1,934	6,863	1,752	7,088	1,791	6,479	1,622	-9.41%
Morrow	8,151	1,990	6,725	1,445	8,758	1,571	13,380	2,207	15,618	2,502	13,754	2,462	14,154	2,512	14,656	2,594	16,090	2,817	19,333	3,355	21,126	3,633	22,933	3,905	7.49%
Polk	23,909	916	35,442	1,237	57,464	1,827	79,527	2,412	74,168	2,197	72,686	1,947	72,256	1,924	69,068	1,823	68,726	1,803	75,095	1,953	77,848	2,003	86,053	2,182	8.94%
Sherman	1,146	1,181	1,252	1,304	1,540	1,621	1,254	1,344	1,734	1,882	1,344	1,523	1,397	1,583	1,454	1,647	1,271	1,429	1,379	1,545	1,582	1,767	1,378	1,535	-13.15%
Tillamook	14,458	1,300	20,458	1,709	25,437	2,068	37,542	2,941	38,040	2,920	32,532	2,576	30,967	2,452	32,162	2,542	30,410	2,397	30,669	2,407	32,554	2,534	35,735	2,757	8.80%
Umatilla	47,700	1,698	63,843	2,123	82,951	2,579	101,475	3,094	107,218	3,292	93,806	2,743	94,964	2,756	93,331	2,689	91,195	2,602	96,020	2,724	101,186	2,841	99,774	2,776	-2.29%
Union	15,391	1,279	19,879	1,599	25,629	2,087	22,319	1,778	27,157	2,142	25,000	1,937	25,607	1,971	26,228	2,004	26,456	2,010	25,222	1,905	26,979	2,027	27,541	2,059	1.62%
Wallowa	7,234	1,996	4,528	1,211	5,438	1,531	6,440	1,804	5,559	1,563	3,709	1,059	4,204	1,202	4,121	1,175	4,460	1,266	3,399	962	5,004	1,409	5,605	1,570	11.39%
Wasco	22,202	1,980	24,999	2,156	24,124	1,998	27,220	2,262	27,932	2,311	25,285	2,004	24,687	1,952	24,057	1,888	25,482	1,975	25,237	1,933	24,390	1,850	26,318	1,971	6.57%
Wheeler	817	1,135	948	1,156	528	681	673	860	611	777	465	646	479	668	422	592	513	718	397	551	495	686	429	585	-14.60%
Yamhill	64,049	1,829	75,024	1,904	128,043	2,940	163,951	3,549	140,989	2,967	145,400	2,901	110,166	2,188	133,592	2,635	134,478	2,630	116,749	2,259	131,626	2,520	138,770	2,622	4.05%
OR. TOTALS	**3,102,776**	**2,075**	**3,835,427**	**2,364**	**4,634,157**	**2,670**	**5,729,878**	**3,105**	**5,216,649**	**2,752**	**4,714,467**	**2,457**	**4,743,891**	**2,459**	**4,816,323**	**2,481**	**4,833,686**	**2,467**	**4,888,202**	**2,467**	**5,175,843**	**2,579**	**5,316,989**	**2,609**	**1.15%**
change in total from previous year			5.84%		1.98%		3.24%		-8.25%		0.97%		0.62%		1.53%		0.36%		1.13%		5.88%		2.73%		
change in per capita from previous year				3.81%		0.95%		1.59%		-9.35%		0.60%		0.09%		0.87%		-0.56%		0.00%		4.54%		1.15%	

Data from 1993-1995, 1997-2000, 2002-2005, 2007 and 2009 is not shown due to page formatting. Please contact DEQ directly for data from these years.

Table 8: Oregon Materials Recovered, 1992-2016

Material Type	1992 Tons	1996 Tons	2001 Tons	2005 Tons	2006 Tons	2008 Tons	2010 Tons	2011 Tons	2012 Tons	2013 Tons	2014 Tons	2015 Tons	2016 Tons
Container glass	69,284	77,231	83,240	94,670	95,946	100,496	107,830	114,982	107,042	106,840	106,853	110,101	107,122
Other glass	41	1,557	9,530	106	673	999	867	840	21	28	32	186	232
Total glass	**69,325**	**78,788**	**92,770**	**94,776**	**96,619**	**101,496**	**108,697**	**115,822**	**107,062**	**106,868**	**106,885**	**110,287**	**107,355**
Aluminum	18,245	17,815	20,511	20,453	21,521	32,888	38,495	19,985	23,733	23,176	21,318	19,310	21,566
Scrap metal	26,927	45,271	223,623	477,513	339,723	354,908	363,805	550,158	511,026	477,097	422,845	408,326	392,517
Tinned cans/aluminum			23,387	0	0	0	0	0	0	0	0	0	0
Tinned cans	7,400	8,635	0	8,719	8,399	9,177	8,890	9,298	8,398	8,944	8,747	8,327	8,363
Aerosol cans	0	0	0	1	1	1	0	1	0	1	2	1	1
Total metals	**52,572**	**71,722**	**267,521**	**506,686**	**369,644**	**396,975**	**411,190**	**579,442**	**543,158**	**509,217**	**452,912**	**435,963**	**422,447**
Cardboard/kraft paper	204,729	304,093	332,876	392,774	440,813	429,703	368,604	320,162	356,906	361,735	375,097	409,082	365,904
Paper Fiber[6]	0	0	0	0	0	344,119	269,353	277,353	299,224	299,004	280,888	274,318	267,205
High-grade paper[6]	67,077	49,298	62,185	39,847	47,324	0	0	0	0	0	0	0	0
Magazines	11,246	17,250	0	0	0	0	0	0	0	0	0	0	0
Phone books[1]	0	3,103	0	0	0	0	0	0	0	0	0	0	0
Mixed waste paper[6]	24,012	53,771	81,418	29,147	39,347	0	0	0	0	0	0	0	0
Newspaper[6]	130,181	141,412	203,021	268,585	263,193	0	0	0	0	0	0	0	0
Fiber-based fuel		9,235	0	0	0	0	0	0	0	0	0	0	0
Total papers	**437,245**	**578,161**	**679,499**	**730,353**	**790,677**	**773,822**	**637,957**	**597,515**	**656,130**	**660,739**	**655,985**	**683,400**	**633,109**
#1 PET beverage	3,329	5,803	0	0	0	0	0	0	0	0	0	0	0
#1 other	58	0	0	0	0	0	0	0	0	0	0	0	0
#2 milk jugs	1,940	3,049	0	0	0	0	0	0	0	0	0	0	0
#2 other	1,841	1,331	0	0	0	0	0	0	0	0	0	0	0
#3 PVC	25	144	0	0	0	0	0	0	0	0	0	0	0
#4 LDPE	1,196	2,501	0	0	0	0	0	0	0	0	0	0	0
#5	360	283	0	0	0	0	0	0	0	0	0	0	0
#6	471	430	102	0	0	0	0	0	0	0	0	0	0
Composite plastic	0	1,077	1,095	370	2,004	1,784	1,964	2,594	2,311	2,222	2,426	2,346	2,369
Mixed plastic	300	1,708	0	0	0	0	0	0	0	0	0	0	0
Other plastic (P7)	0	12	0	0	0	0	0	0	0	0	0	0	0
Plastic bottles[2]			0	0	0	0	0	0	0	1	0	0	0
Plastic film			4,825	11,297	11,594	10,739	12,839	11,747	14,886	14,583	14,831	13,680	15,873
Plastic other			2,005	8,193	9,426	9,302	9,019	10,167	10,720	9,562	12,507	13,348	13,245
Rigid plastic containers			16,352	16,047	19,439	19,790	28,599	30,100	29,485	28,740	30,692	24,370	24,697
Total plastic	**9,520**	**16,338**	**24,380**	**35,907**	**42,463**	**41,615**	**52,421**	**54,608**	**57,401**	**55,107**	**60,455**	**53,745**	**56,183**
Antifreeze	5	52	1,864	2,871	3,085	2,720	6,762	3,060	2,598	2,680	2,719	2,916	2,472
C & D -- roofing[7]			28,904	11,852	10,072	3,885	15,803	12,998	18,223	15,895	23,743	31,260	30,437
Carpeting -- used			1,064	784	0	300	1,641	1,807	1,837	1,409	1,355	654	0
Diesel				16	151	152	33	32	33	32	33	34	33
Electronics			1,640	3,790	6,345	10,513	17,587	19,586	25,957	21,929	22,344	20,696	18,349
Fluorescent lamps	0	7	267	374	453	451	620	673	662	600	422	172	364
Gypsum wallboard	3,695	9,419	13,164	3,121	4,174	3,126	2,138	3,364	5,025	4,057	3,819	3,630	4,225
Household Haz Waste			12	106	143	305	452	295	338	323	246	276	326
Alkaline batteries			4	0	0	0	0	0	0	0	0	0	0
Mixed batteries				154	120	188	247	336	436	375	301	259	333
Lead acid batteries[3]	176	559	10,134	12,861	15,509	14,602	15,305	14,467	14,036	14,637	12,562	16,750	17,537
Lithium batteries				0	0	0	0	0	0	0	0	0	0
NiCad batteries			18	0	0	0	0	0	0	0	0	0	0
Old broken crayons	0	0	0	0	0	0	0	0	0	0	0	0	0
Paint[5]	120	489	1,403	2,366	1,434	1,141	1,931	3,015	3,396	3,652	3,826	4,430	4,263
Porcelain	0	5	483	227	307	553	327	203	551	960	1,071	840	366
Rubber tire buffings[4]	0	2,935	0	0	0	0	0	0	0	0	0	0	0
Scrap film (X-ray)	42	68	0	0	0	0	0	0	0	0	0	0	0
Solvents[5]	16	110	248	280	261	526	312	406	444	369	480	454	457
Textiles		508	3,762	3,620	1,819	1,244	216	232	872	948	1,248	1,266	1,182
Tires[5]	34,392	24,360	17,339	27,293	21,931	25,091	20,834	23,361	23,470	30,326	21,711	27,793	31,257
Used Motor Oil[5]	28,796	47,632	45,675	55,466	52,837	43,871	31,443	30,052	37,032	35,544	34,516	34,103	44,976
Total other	**67,243**	**86,145**	**125,979**	**125,181**	**118,640**	**108,668**	**115,648**	**113,885**	**134,909**	**133,736**	**130,394**	**145,532**	**156,577**
Animal waste/grease	0	22,957	26,226	22,537	15,928	14,512	11,942	7,680	7,148	7,621	10,491	13,009	15,002
Food waste	0	5,000	9,685	9,644	12,430	21,475	39,367	42,741	47,665	50,143	46,289	42,515	57,282
Wood waste[5]	112,425	243,773	424,569	449,791	503,967	371,531	340,794	368,356	362,448	387,196	349,253	378,417	289,135
Yard debris[5]	91,348	235,562	348,472	548,493	543,683	496,052	445,944	426,095	475,578	480,238	494,607	529,253	529,519
Total organics	**203,773**	**507,292**	**808,951**	**1,030,465**	**1,076,008**	**903,570**	**838,047**	**844,872**	**892,839**	**925,198**	**900,640**	**963,195**	**890,937**
Adj. rounding/unspecified		2	-1							-6	-2	-4	-52
OREGON TOTALS	**839,678**	**1,338,446**	**1,999,099**	**2,523,367**	**2,494,050**	**2,326,146**	**2,163,959**	**2,306,144**	**2,391,499**	**2,390,859**	**2,307,269**	**2,392,117**	**2,266,556**

[1]Phone books included in mixed waste paper in 1992, 1993 and 2001 and subsequent years.

[2]About 900 tons of plastic bottles was included with mixed plastics in the 1995 survey.

[3]Includes only batteries collected at household hazardous waste collection events until 2001.

[4]From 1998 rubber tire buffings were included with tires.

[5]Includes Marion Co. materials in 2001 and subsequent years burned for energy.

[6]In 2007 and subsequent years, Mixed Waste Paper, Hi Grade & Newspaper was combined into Paper Fiber

[7]Asphalt Roofing was included as burned for energy only in years 2001-2006

Data from 1993-1995, 1997-2000, 2002-2005, 2007 and 2009 is not shown due to page formatting. Please contact DEQ directly for data from these years.

Table 9: Disposition of Recovered Materials, 2016

Wasteshed	Total Recovered	Recycled	% of Total	Energy Recovery	% of Total	Compost	% of Total	Stock
Baker	3,111	2,212	71%	112	4%	786	25%	0
Benton	34,316	19,588	57%	428	1%	14,288	42%	12
Clatsop	20,675	12,223	59%	7,826	38%	612	3%	15
Columbia	13,817	9,986	72%	2,936	21%	895	6%	0
Coos	13,220	12,902	98%	229	2%	77	1%	12
Crook	5,302	4,050	76%	2	0%	1,155	22%	96
Curry	7,001	6,966	100%	35	0%	0	0%	0
Deschutes	79,757	48,366	61%	111	0%	31,267	39%	12
Douglas	27,838	17,626	63%	7,885	28%	2,294	8%	34
Gilliam	349	348	100%	0	0%	0	0%	1
Grant	1,457	1,363	94%	52	4%	42	3%	0
Harney	1,156	1,036	90%	94	8%	1	0%	25
Hood River	7,472	6,221	83%	108	1%	1,130	15%	13
Jackson	110,488	54,686	49%	21,150	19%	34,639	31%	12
Jefferson	6,166	5,744	93%	139	2%	282	5%	0
Josephine	38,486	23,428	61%	4,764	12%	10,282	27%	12
Klamath	20,065	14,784	74%	2,528	13%	2,740	14%	12
Lake	897	874	97%	1	0%	21	2%	1
Lane	258,370	142,397	55%	41,402	16%	74,543	29%	27
Lincoln	17,013	12,461	73%	2,191	13%	2,352	14%	8
Linn	60,103	44,772	74%	1,140	2%	14,179	24%	12
Malheur	7,977	7,464	94%	66	1%	435	5%	12
Marion	237,152	125,598	53%	50,690	21%	60,861	26%	3
Metro	1,153,152	748,303	65%	138,576	12%	266,219	23%	54
Milton-Freewater	1,809	1,580	87%	43	2%	174	10%	12
Morrow	5,455	5,217	96%	238	4%	0	0%	0
Polk	39,520	21,139	53%	9,194	23%	9,190	23%	-4
Sherman	158	155	98%	2	1%	0	0%	1
Tillamook	9,331	8,232	88%	56	1%	1,035	11%	7
Umatilla	26,966	22,154	82%	3,426	13%	1,377	5%	10
Union	6,916	4,692	68%	47	1%	2,176	31%	0
Wallowa	1,513	902	60%	11	1%	601	40%	0
Wasco	6,900	5,952	86%	142	2%	779	11%	26
Wheeler	57	51	88%	0	0%	0	0%	7
Yamhill	42,588	24,724	58%	1,797	4%	16,055	38%	12
Total	**2,266,555**	**1,418,197**	**63%**	**297,426**	**13%**	**550,489**	**24%**	**444**