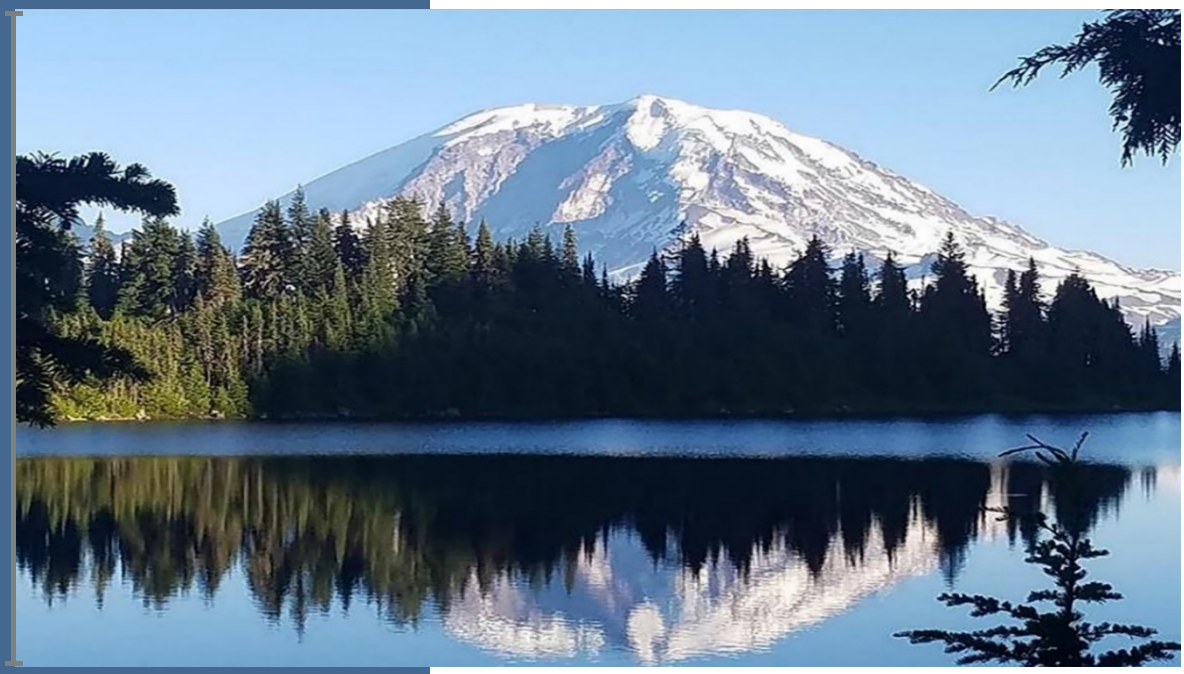

Measuring Waste Generation and Recovery in Washington

Methodology
2017 and Beyond

Solid Waste Management Program

Washington State Department of Ecology

Olympia, Washington

July 2021, Publication 21-07-025

DEPARTMENT OF ECOLOGY
State of Washington

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Related Information

- Related data is available on Ecology's Solid Waste Management website: Solid waste & recycling data [1]

Relevant documents.
Publication 21-07-024: Methodology-MSW_Recycling-1986-2016[2]

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[1] https://ecology.wa.gov/Research-Data/Data-resources/Solid-waste-recycling-data
[2] https://apps.ecology.wa.gov/publications/summarypages/2107024.html
[3] www.ecology.wa.gov/contact

Methodology for Measuring Waste Generation and Recovery

In Washington State
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ECOLOGY
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Purpose

This document provides background and methodology for Washington Department of Ecology (Ecology) Solid Waste Management waste generation and recovery metrics from 2017.[4] It also clarifies how materials, generator sectors, and processing methods are counted, and provides rationale for counting decisions.

This document has no bearing on regulatory status.

This helps to fulfill strategic recommendations for Ecology's Solid Waste Management (SWM) program's data collection and analysis, to provide more communication on measurement methodologies.

Audience

All internal and external stakeholders with an interest in Washington's recycling and recovery data, including policy makers at the state and local government level, businesses, and non-governmental organizations are among the audience members for this document.

Background

For an explanation of the methodology for determining recycling and diversion rates prior to 2016, see Measuring Recycling, Diversion, and Recovery in Washington: Background and Methodology, 1986-2016[5].

In 2018, as the State Solid and Hazardous Waste Plan: Moving Washington Beyond Waste and Toxics was implemented, Ecology began incorporating more elements of Sustainable Materials Management (SMM) into our work. According to the US Environmental Protection Agency, SMM is "an approach to serving human needs by using/reusing resources most productively and sustainably throughout their life cycles, from the point of resource extraction through material disposal. This approach seeks to minimize the amount of materials involved and all the associated environmental impacts, as well as account for economic efficiency and social considerations."

Definitions

Diversion is defined as waste diverted from landfills, which includes materials reused and burned for energy in addition to those that are recycled. Includes materials collected for recycling; diverted materials were tracked in addition to materials collected for recycling starting in 1999.

[4] Calendar year data.

[5] https://fortress.wa.gov/ecy/publications/SummaryPages/2107024.html

Diversion rate is the percentage of materials that are diverted from disposal in landfills and incinerators for recycling, reuse, and other beneficial uses.

MSW recycling, for purposes of determining historic MSW recycling rates (1986-2016), includes mixed solid waste and other materials collected for recycling or disposal from municipal sources (residential and commercial), excludes source separated construction and demolition debris, agricultural waste, mining waste, and most industrial sources. See also the definition in Chapter 173-350 WAC.

MSW recycling rate (or recycling rate) refers to the percentage of MSW material that is recycled instead of disposed in landfills or incinerators.

Recovery is defined as material that is diverted from the solid waste stream for the intended purpose of recycling, composting, burning source-separated materials for energy, anaerobic digestion, land application, and other beneficial uses. Similar to **Diversion** (however focuses on the resource aspect instead of offsetting landfill).

Recovery rate is the percentage of materials collected for recycling, composting, and burning source-separated materials for energy. Similar to the previously calculated diversion rate.

Waste generation includes all discarded materials and wastes entering the solid waste and materials management systems that are disposed, recycled, and recovered for other beneficial uses. Excludes materials collected for reuse, backyard composting, and other home or on-site forms of waste management.

Waste Generation

Ecology measures waste generation through annual reports from regulated solid waste handling facilities and the recycling survey. Activities counted in waste generation are landfill disposal, incineration of mixed municipal solid waste (MSW), recycling, composting, anaerobic digestion, land application, and burning source-separated materials for energy. Reuse is excluded as it is generally not a regulated solid waste handling activity.

The calculation for the waste generation is:

MSW collected for recycling + recovered materials +
MSW disposed in landfills and incinerators + other recoverable wastes disposed

Focus on Recovery

With a shift toward SMM and lifecycle thinking, the idea of landfill diversion became obsolete as the intention was not lining up with the impact. Diversion from landfill as the determining factor of success should not be the goal. We want to focus on positive outcomes and putting a material to a useful purpose. Landfill space is not the only or biggest concern anymore. Lifecyde data shows the importance of “recovering” materials for greenhouse gas and energy benefits

instead of landfilling them. The focus is on recovery for a beneficial use, and not on landfill avoidance.

Work is increasing on this topic, so to help with this transition, Ecology began using the term recovery to replace diversion starting in 2016 for most of our data gathering and reporting from 2000 to present.[6] We feel it will help focus on positive outcomes when materials are recovered from the waste stream for other uses, rather than simply diverted from disposal in a landfill.

Ecology measures recovered materials through annual reports from regulated facilities and the recycling survey for non-regulated facilities. Activities included in recovery and the recovery rate are recycling, composting, anaerobic digestion, land application, and burning source-separated materials for energy. Reuse is excluded as it is generally not a regulated solid waste handling activity.

The calculation for the recovery rate is:

(MSW recycling + other recovered materials)

(MSW collected for recycling + recovered materials + MSW disposed in landfills and incinerators + other recoverable wastes disposed)

Table 1: Materials collected, end uses, and counting for waste generation and recovery

Incoming materials reported as collected by regulated solid waste facilities and on recycling surveys	End use as reported[7]	Counting under Waste Generation and Recovery rate
Agricultural Organics	Recycling	Yes
Aluminum Cans	Recycling	Yes
Anti-freeze	Recycling	Yes
Appliances/White Goods	Recycling	Yes
Ash, Sand & Dust (used in asphalt production)	Recycling	Yes
Asphalt & Concrete	Recycling	Yes
Batteries - Auto Lead Acid	Recycling	Yes
Cardboard	Recycling	Yes
Carpet & Pad	Recycling	Yes
Cartons	Recycling	Yes
Container Glass	Recycling	Yes
Container Glass (used as aggregate)	Recycling	Yes
Electronics	Recycling	Yes
Fats and Oils	Recycling	Yes
Ferrous Metals	Recycling	Yes

[6] Historical data with calculated MSW recycling and diversion rates are available from SWM staff.
[7] End uses for purposes of counting are recycling (includes compost), alternative energy, reuse, and disposal (includes landfill or incineration).

Incoming materials reported as collected by regulated solid waste facilities and on recycling surveys	End use as reported[7]	Counting under Waste Generation and Recovery rate
Fluorescent light bulbs	Recycling	Yes
Food Processing Waste (pre-consumer)	Recycling	Yes
Food Scraps (post-consumer)	Recycling	Yes
Gypsum	Recycling	Yes
HDPE Plastics	Recycling	Yes
High Grade Paper	Recycling	Yes
Household Batteries	Recycling	Yes
Industrial Batteries	Recycling	Yes
Industrial Organics	Recycling	Yes
Industrial Paper	Recycling	Yes
Landclearing Debris	Recycling	Yes
LDPE Plastics	Recycling	Yes
Mattresses	Recycling	Yes
Miscellaneous	Recycling	Yes
Mixed Paper	Recycling	Yes
Mixed Plastic	Recycling	Yes
Newspaper	Recycling	Yes
Nonferrous Metals	Recycling	Yes
Oil Filters	Recycling	Yes
Other Organics	Recycling	Yes
Other Recyclable Plastics	Recycling	Yes
PET Plastic Bottles	Recycling	Yes
Photographic Films	Recycling	Yes
Post-Industrial and Flat Glass	Recycling	Yes
Post-Industrial Plastics	Recycling	Yes
Roofing Material	Recycling	Yes
Rubber Materials	Recycling	Yes
Steel Cans	Recycling	Yes
Textiles (rags, clothing, etc.)	Recycling	Yes
Tires (baled)	Recycling	Yes
Tires (recycled)	Recycling	Yes
Used Oil	Recycling	Yes
Wood Waste (recycled)	Recycling	Yes
Yard Debris	Recycling	Yes
Yard Debris and Food (mixed)	Recycling	Yes
Agricultural Organics (for anaerobic digestion)	Energy[8]	Yes
Construction & Demolition Debris	Energy	Yes

[8] Source separated at a recycling facility and sent to alternative energy markets such as industrial boilers or anaerobic digestion.

Incoming materials reported as collected by regulated solid waste facilities and on recycling surveys	End use as reported[7]	Counting under Waste Generation and Recovery rate
Landclearing Debris (burned for energy)	Energy	Yes
Other Fuels (burned for energy)	Energy	Yes
Tires (burned for energy)	Energy	Yes
Used Oil (burned for energy)	Energy	Yes
Wood Waste (burned for energy)	Energy	Yes
Yard Waste (burned for energy)	Energy	Yes
Food (recovered by food banks)	Reuse	Excluded[9]
Paint	Reuse	Excluded
Refillable Glass Beer Bottles	Reuse	Excluded
Reuse - Clothing & Household items	Reuse	Excluded
Reuse - Construct/demo Items	Reuse	Excluded
Reuse - Miscellaneous	Reuse	Excluded
Tires (retreaded/reused)	Reuse	Excluded
Municipal solid waste (mixed)[10]	Disposal	Yes
Other potentially recoverable materials disposed in segregated loads[11]	Disposal	Yes
Other non-recoverable materials[12]	Disposal	Counted as waste generation; excluded from recovery rate

An Ecology document addressing Frequently Asked Questions regarding waste generation and recovery counting methods and providing more rationale for counting changes made for 2017 data is available upon request (FAQ Ecology Metrics Changes-04-2019).

Historic MSW recycling and recovery data since 1986 and a complete list of materials tracked are available by contacting staff. Recovery data since 2000 is available on Ecology's Solid Waste Management website: Solid waste & recycling data [13].

[9] Materials excluded from waste generation and the recovery rate are tallied and reported separately.
[10] Disposed items are included in the denominator of recovery rates. Includes landfilled and incineration of mixed MSW.
[11] Used to calculate the recovery rate, in the denominator. Examples: disposed construction and demolition wastes, inert wastes, industrial wastes, tires, wood and landclearing debris.
[12] Examples: disposed solid wastes from environmental cleanups such as contaminated soils and asbestos.
[13] https://ecology.wa.gov/Research-Data/Data-resources/Solid-waste-recycling-data