EPA Sustainable Materials Management Web Academy

Material Characterization and Economic Impacts of Recycling: 2020 Reports

Thursday, February 25, 2021

https://www.epa.gov/smm/sustainable-materials-management-web-academy

Our Speakers

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Rethink

Outline

- Advancing Sustainable Materials Management: 2018 Facts and Figures Report
  - Overview and trends
  - Key municipal solid waste (MSW) data
  - Reduction in greenhouse gas emissions
  - Construction and demolition (C&D) debris data
  - Web site
  - Economics data
- Recycling Economic Information (REI) Report

EPA Facts & Figures

Data on generation, recycling, composting, combustion with energy recovery and landfilling

- For municipal solid waste (MSW)
- Construction and demolition debris data provided starting with 2013 data year

Report issued every year for over three decades

- Data tables go back to 1960

New for 2018 report

- Updated data for 2018
- Enhanced wasted food methodology
- Information on C&D management

Overview of the Methodology

Scope

- Municipal solid waste (MSW), or trash
- For example, packaging, food, yard trimmings, furniture, electronics, tires and appliances
- Also includes C&D debris generation and management.

Sources of MSW

- Residential waste
- Institutions such as schools, hospitals and prisons
- Commercial sources such as restaurants, office buildings and retail establishments
- Non-process waste from industrial facilities

Overview of the Methodology, cont.

Materials Flow Approach

- Based on national data
- A top-down approach

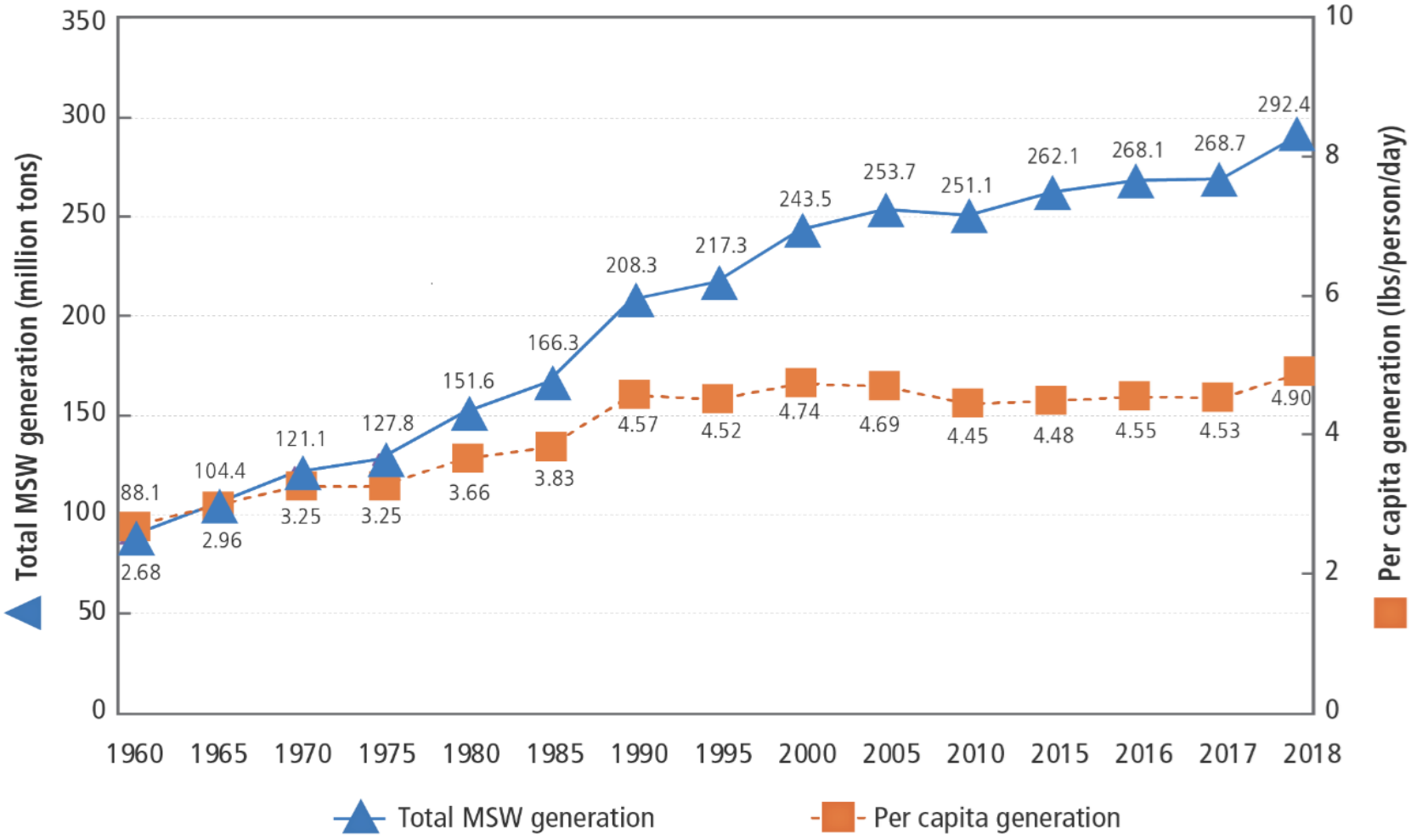
Sources of Data

- Industry associations and businesses
- Federal government
- State websites
- Supplemented by waste characterizations and other research reports

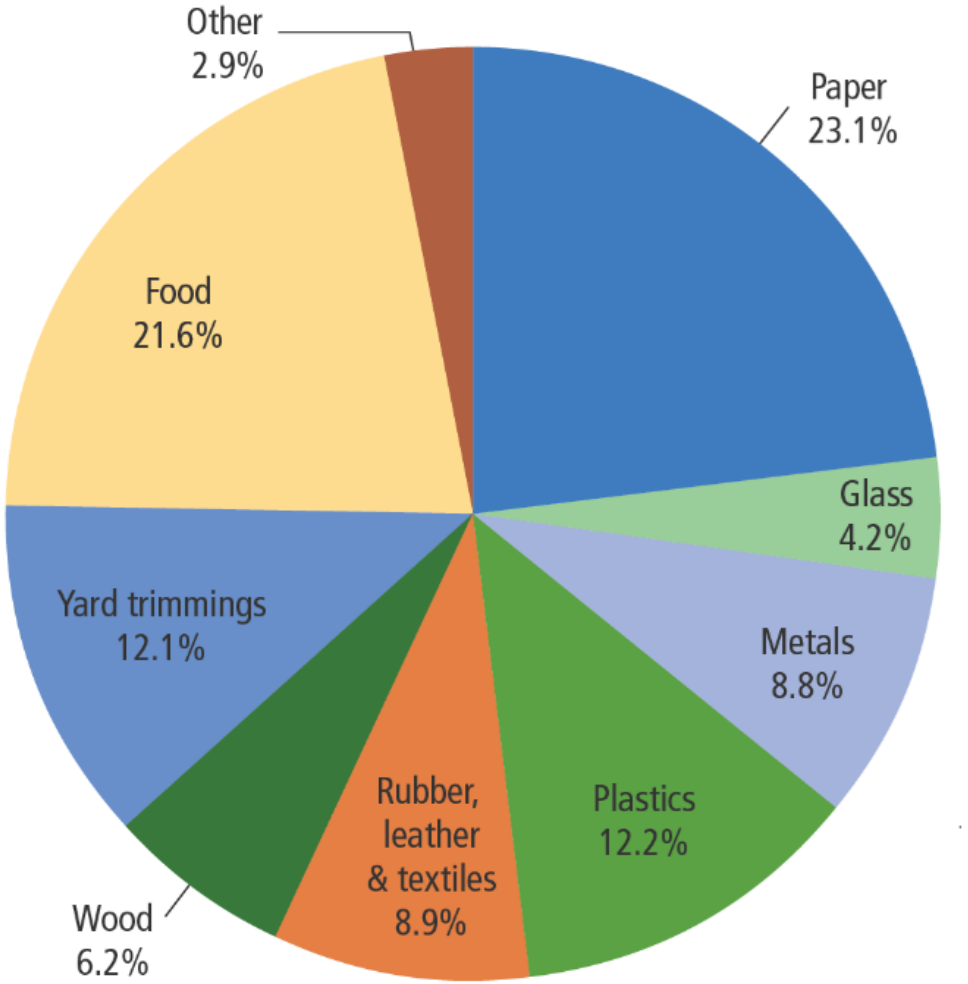
Key MSW Data

MSW Generation and Management	2017	2018
Million tons MSW generated	268.7	292.4
Per capita generation rate in pounds per person per day	4.53	4.90
Million tons recycled	67.0	69.1
Million tons composted	27.0	24.9
Recycling plus composting rate	35.0%	32.1%
Million tons of food managed via other methods	N/A	17.7
Million tons combusted with energy recovery	34.2	34.6
Million tons landfilled	140.5	146.1

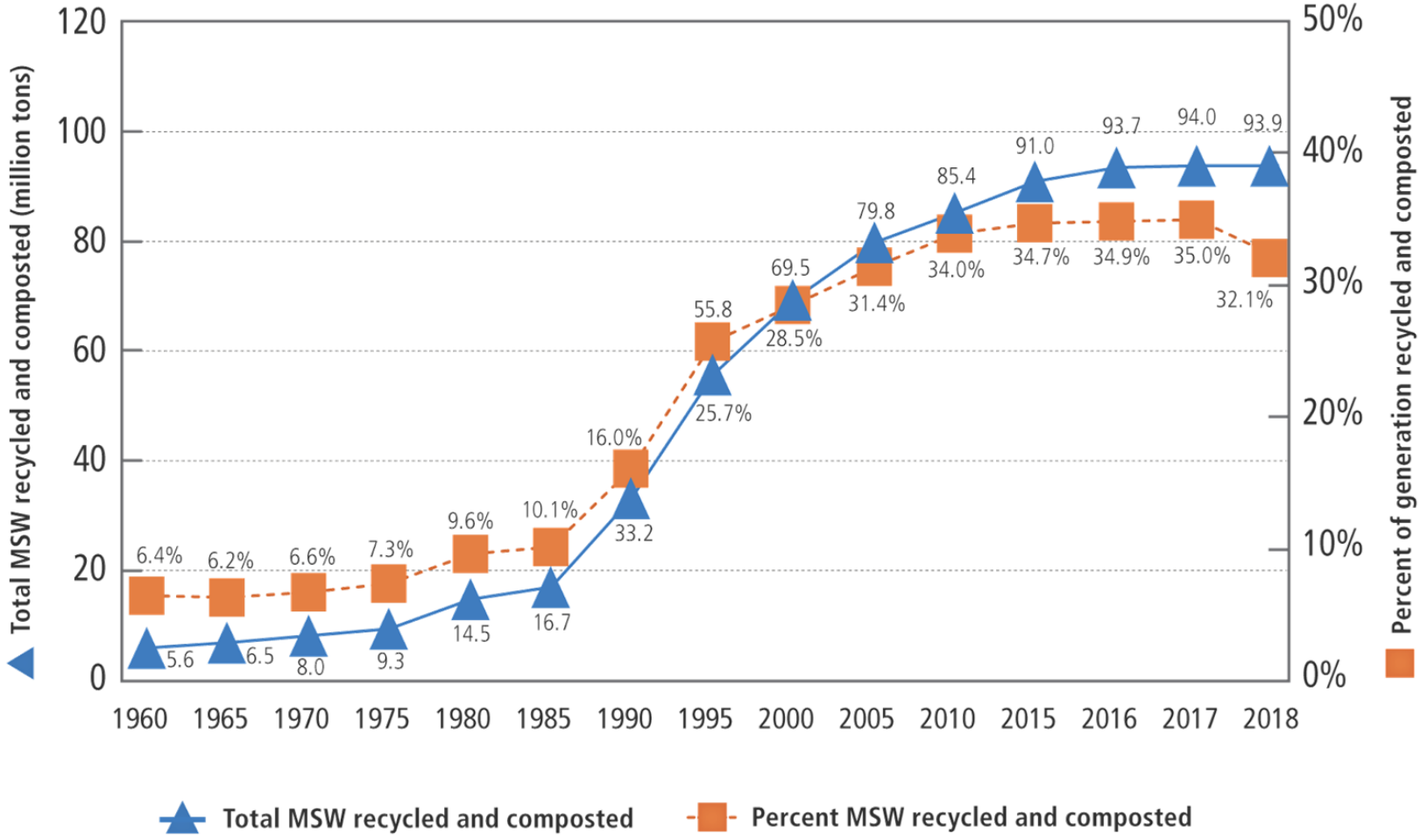
MSW Generation Rates
1960 to 2018



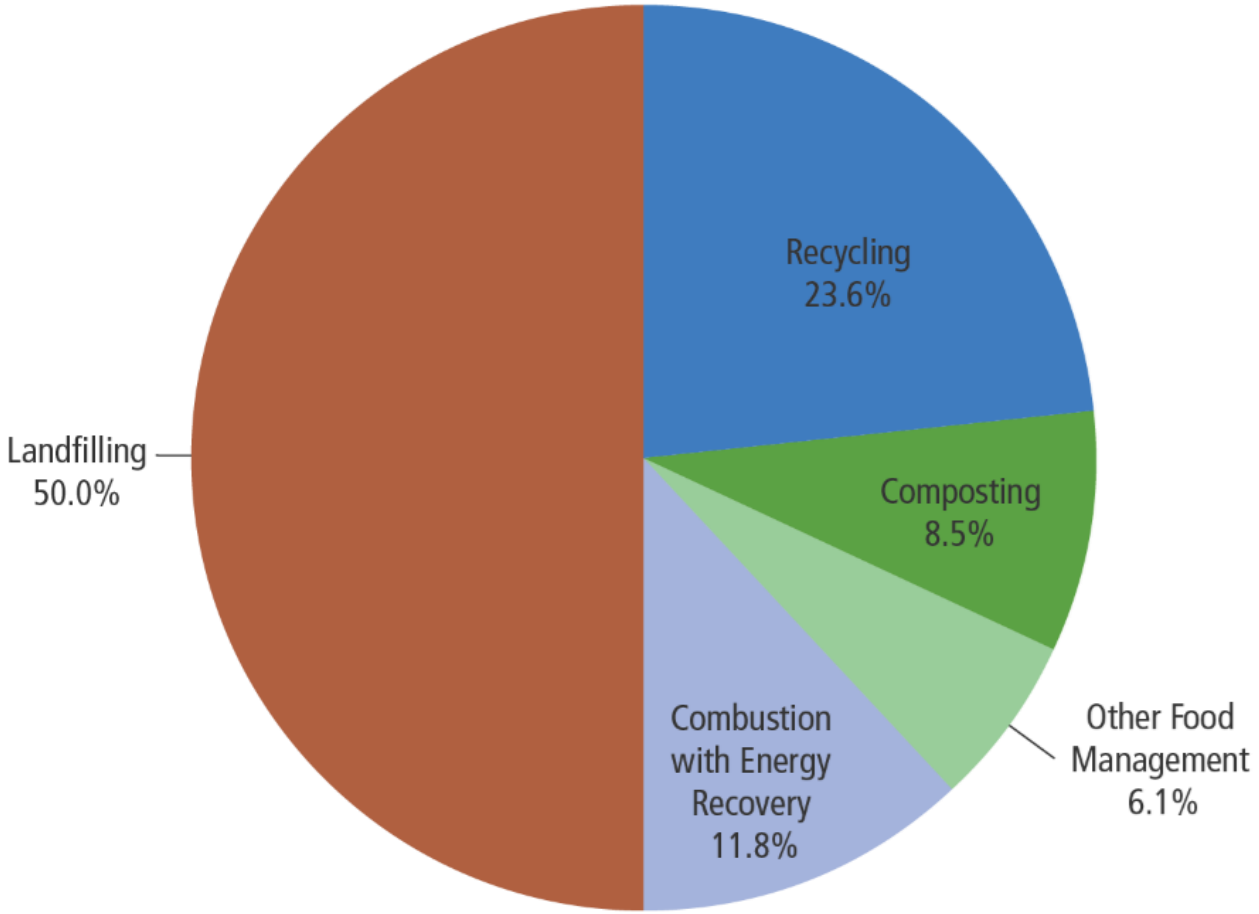
MSW Generation in 2018
292.4 Million Tons



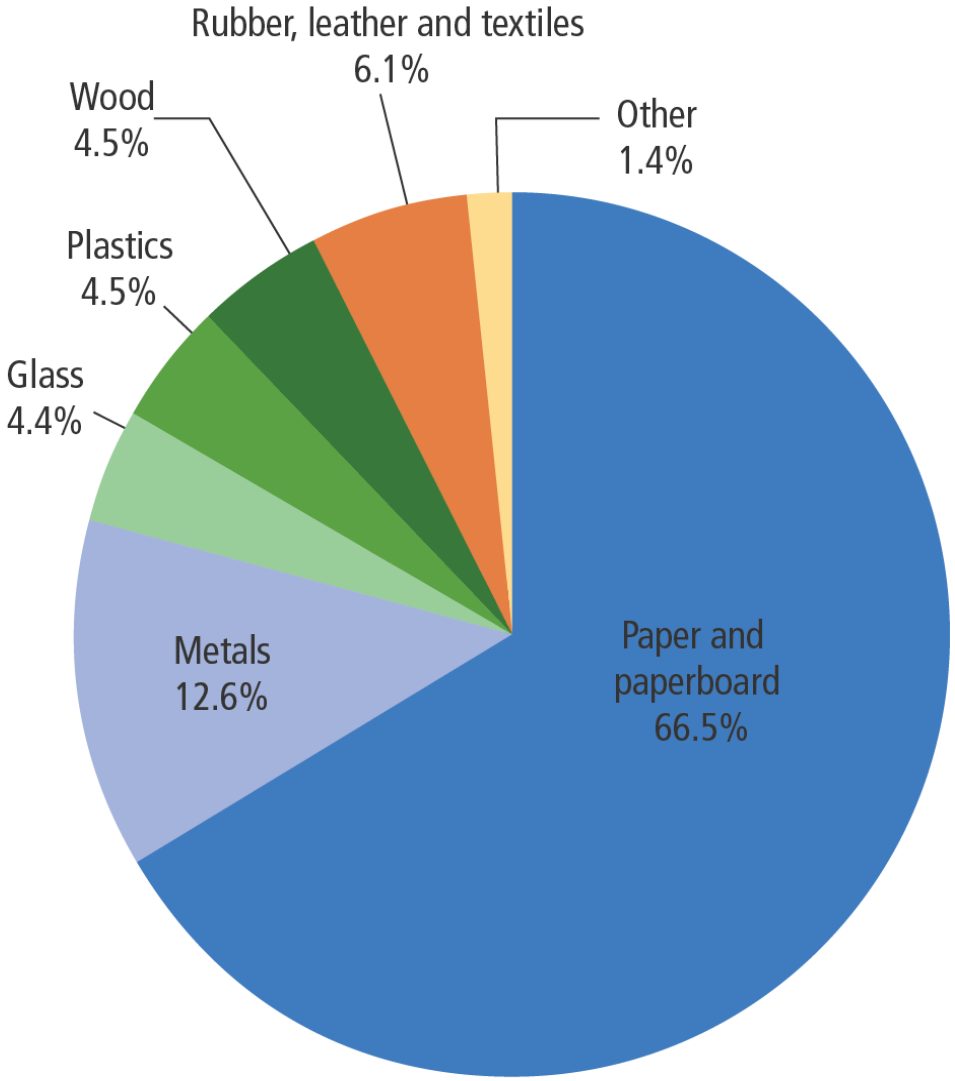
MSW Recycling and Composting Rates 1960 to 2018



MSW Management in the United States in 2018 (292.4 million tons)

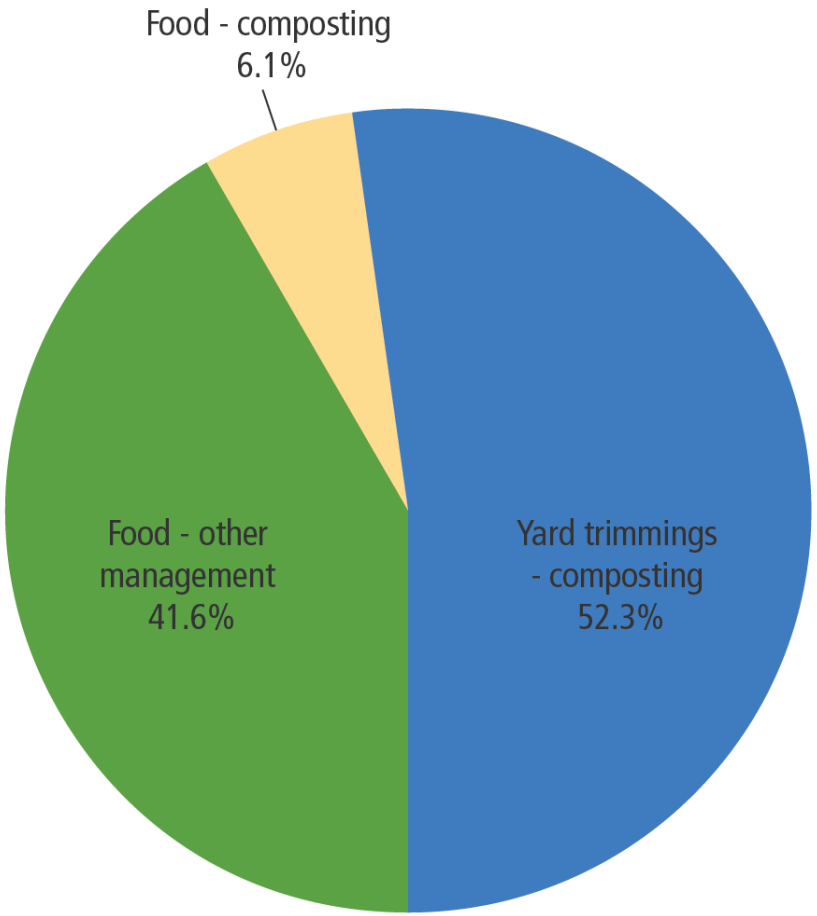


MSW Recycling in 2018
69.1 million tons

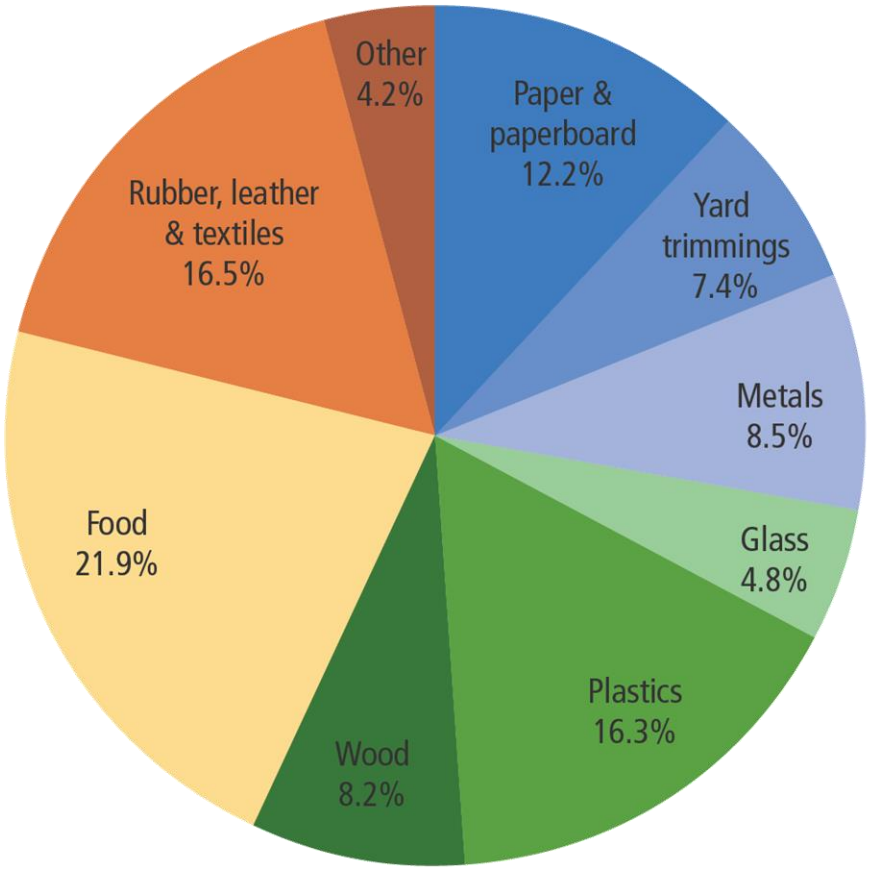


EPA United States Environmental Protection Agency

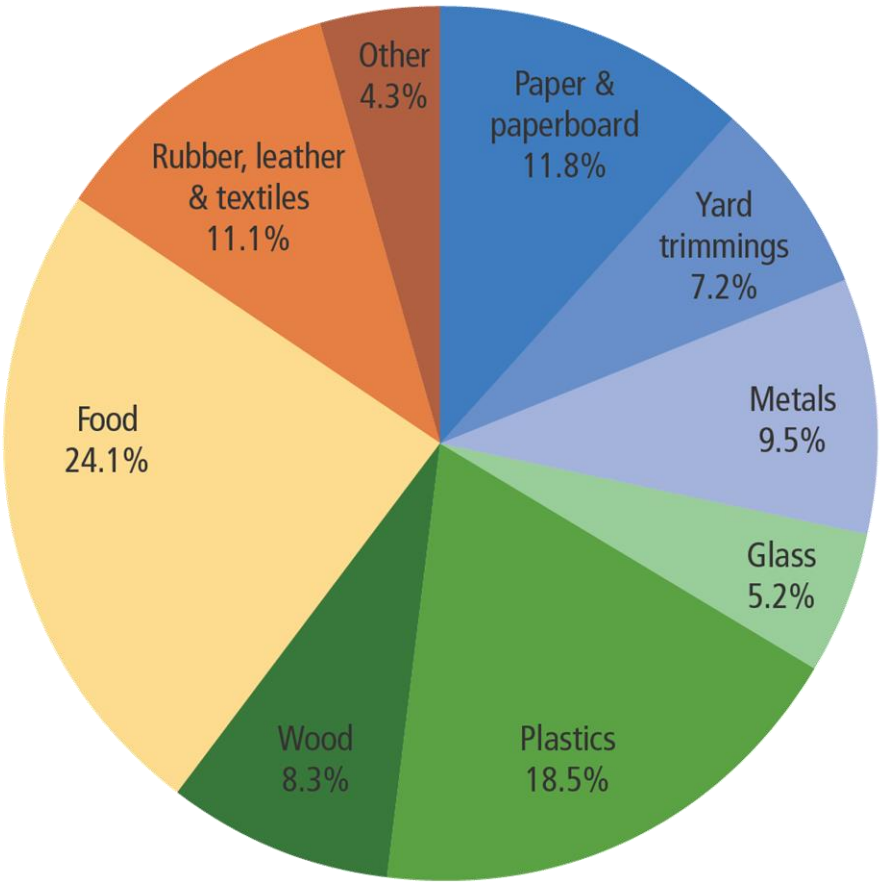
MSW Composting and Other Food Management in 2018
42.6 million tons



MSW Combusted with Energy Recovery in 2018 (34.6 million tons)



MSW Landfilled in 2018
146.1 million tons

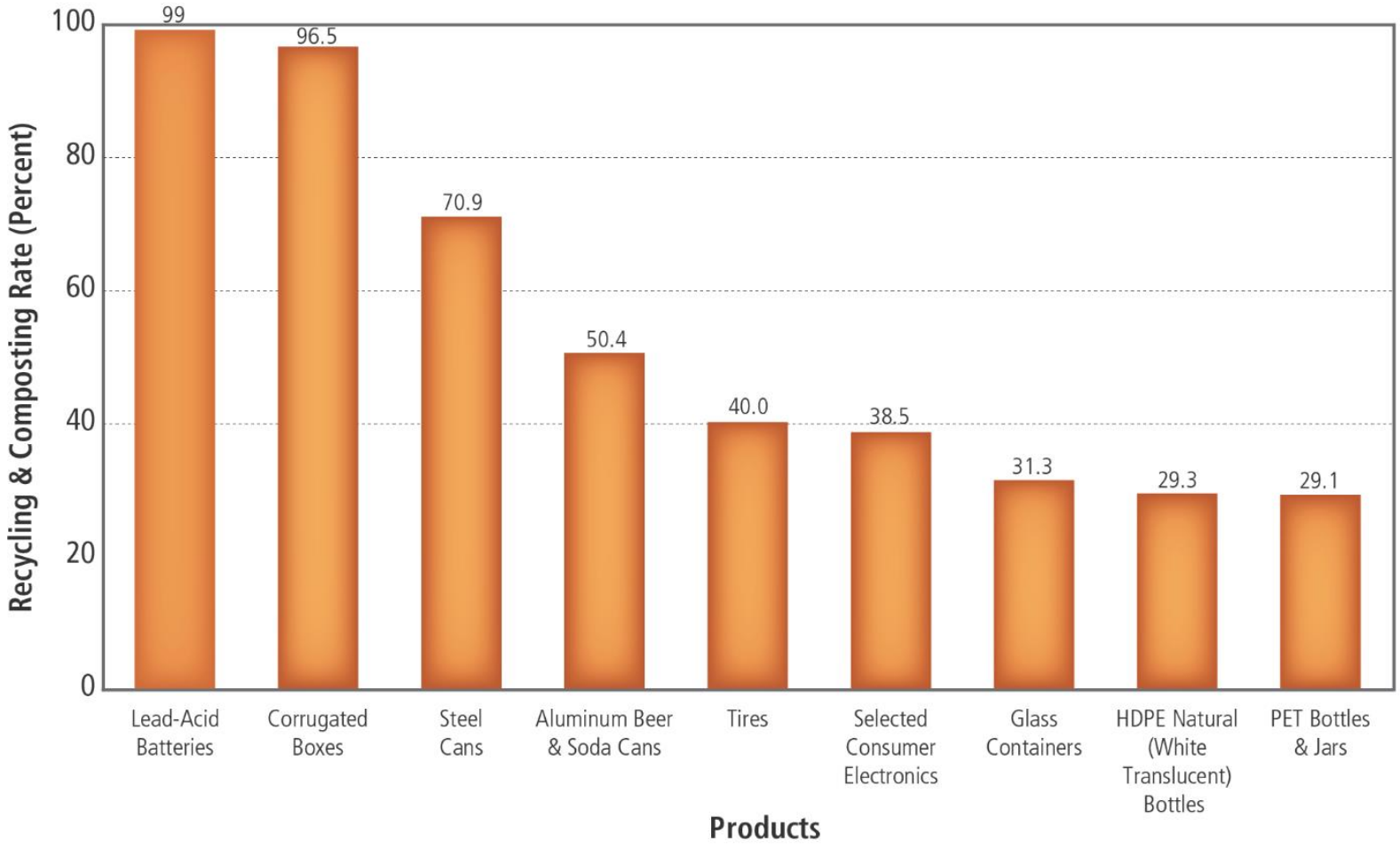


Key Materials/Products

Recycling Rates

- Paper and paperboard recycling was 68.2%
- Metals recycling was 34.1%
- Glass recycling was 25.0%
- Plastics recycling was 8.7%
  - HDPE Natural (white translucent) bottle recycling was 29.3%
  - PET bottles and jars recycling was 29.1%

Selected Products with High Recycling Rates, 2018*



*Does not include combustion with energy recovery.

Food

Generation

- 63.1 million tons in 2018, up from 40.7 million tons in 2017

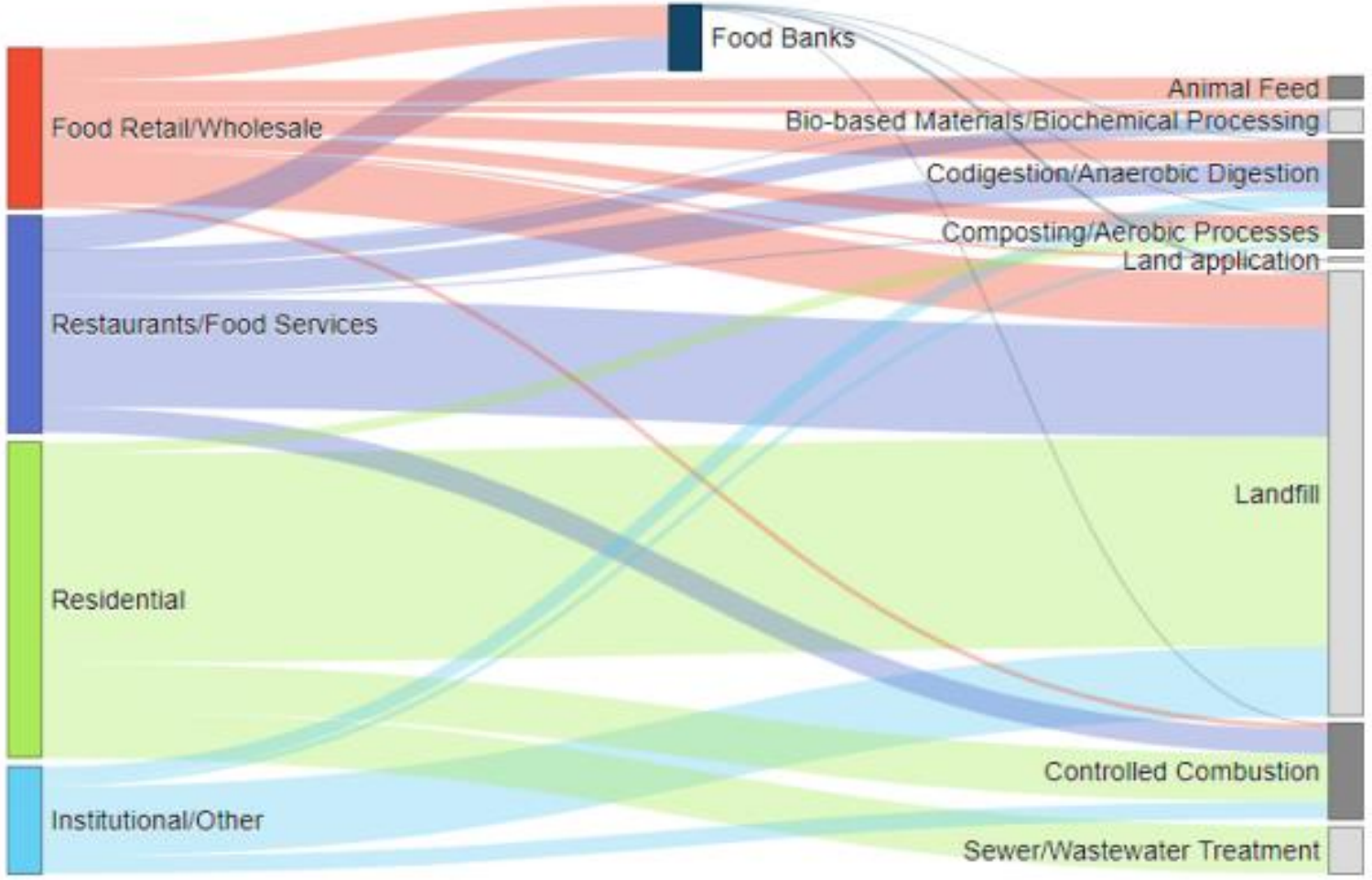
Composting

- 2.6 million tons of food and other organic materials composted, the same tonnage as in 2017.

Other Food Management Pathways-17.7 million tons

- Animal feed
- Bio-based materials/biochemical processing
- Codigestion/anaerobic digestion
- Donation
- Land application
- Sewer/wastewater treatment

Food, continued



https://www.epa.gov/sites/production/files/2020-11/documents/2018_wasted_food_report.pdf

Food, continued

Combustion

- 22% of MSW combusted was food in 2018.

Landfilling

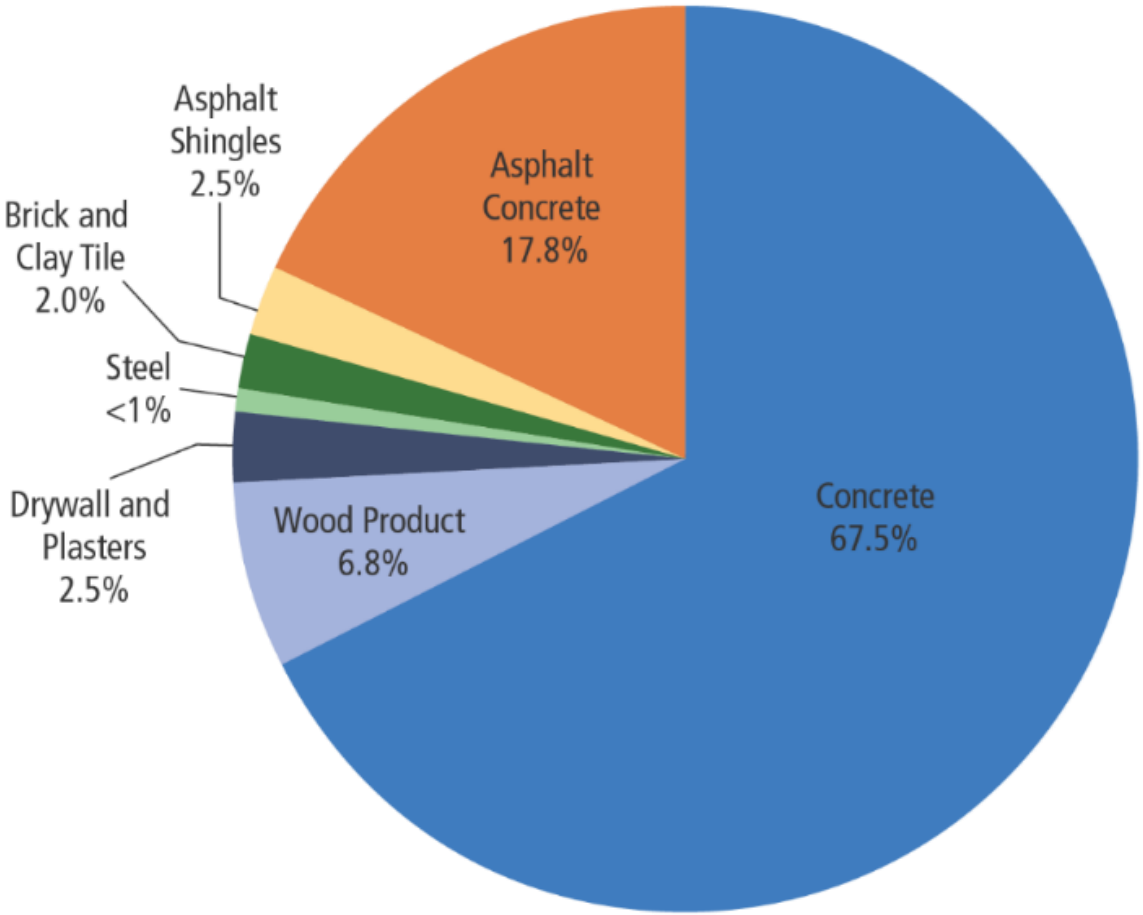
- 24.1% of MSW landfilled was food.
- 55.9% of wasted food was landfilled.

Reduction in Greenhouse Gas (GHG) Emissions

Greenhouse Gas (GHG) Emissions

- In 2018, management of MSW prevented over 193 million metric tons of carbon dioxide equivalent of GHG emissions.
- These reductions are comparable to the annual emissions from over 41 million passenger vehicles.
- These estimates are calculated using EPA's WARM (Waste Reduction Model) methodology.

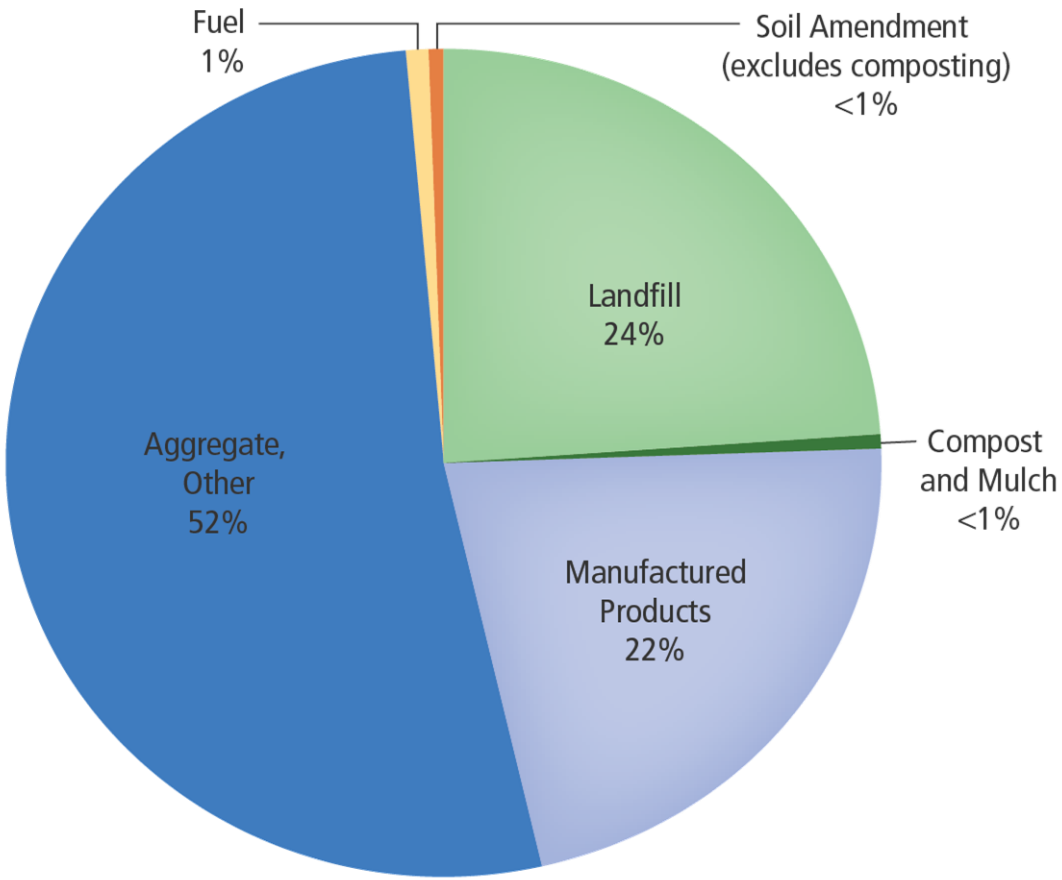
C&D Debris Generation in 2018
600 Million Tons



C&D Debris Generation by Source in 2018
600 Million Tons

	Buildings	Roads and Bridges	Other
Concrete	102.0	168.3	134.9
Wood Products[7]	39.5	0.0	1.3
Drywall and Plasters	15.2	0.0	0.0
Steel[8]	4.7	0.0	0.0
Brick and Clay Tile	12.3	0.0	0.0
Asphalt Shingles	15.1	0.0	0.0
Asphalt Concrete	0.0	107.0	0.0
Total	**188.8**	**275.3**	**136.2**

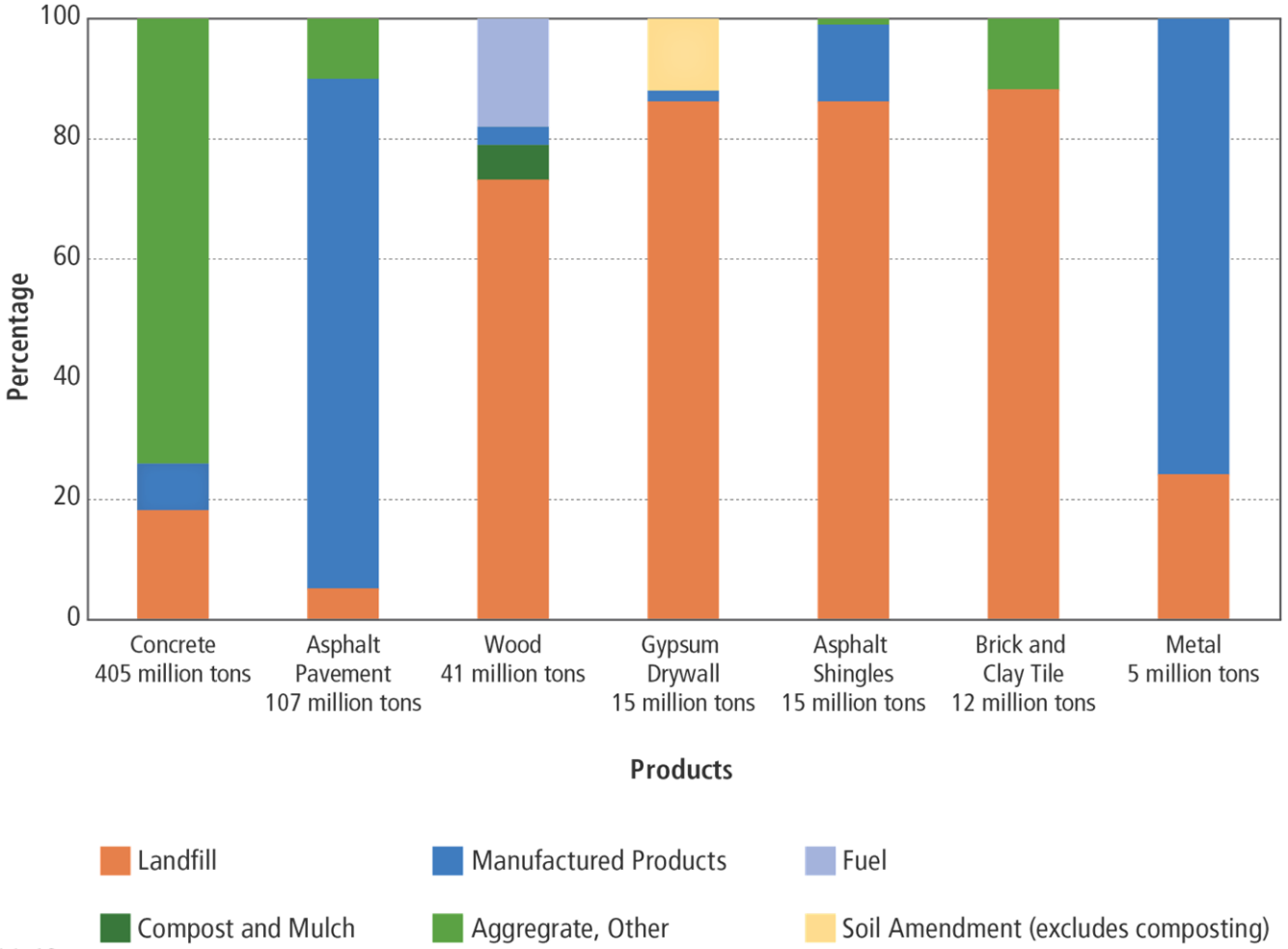
C&D Debris Management by Destination in 2018
600 Million Tons



C&D Debris Management by Material and Destination in 2018
600 Million Tons

Material Type in C&D Debris	Landfill	Next Use					Total Next Use
		Compost and Mulch	Manufactured Products	Aggregate, Other	Fuel	Soil Amendment	
Concrete	71.2	0	32.8	301.2	0	0	334.0
Wood	29.6	2.5	1.2	0	7.5	0	11.2
Gypsum Drywall	13.2	0	.2	0	0	1.9	2.1
Metal	1.1	0	3.6	0	0	0	3.6
Brick and Clay Tile	10.8	0	0	1.5	0	0	1.5
Asphalt Shingles	13.0	0	2.0	.1	.02	0	2.1
Asphalt Concrete	4.9	0	91.8	10.3	0	0	102.1
TOTAL	**143.8**	**2.5**	**131.6**	**313.1**	**7.5**	**1.9**	**456.6**

C&D Debris Management by Destination in 2018 (percent of total generation amount for the material) 600 million tons

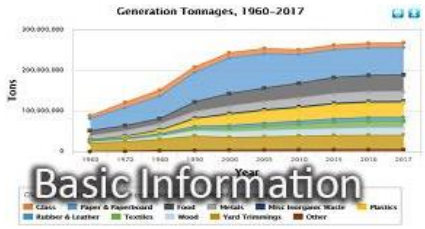


Facts and Figures about Materials, Waste and Recycling

NOTE:
The facts and figures data only represent municipal solid waste in the United States. The most recent data are from 2017.

Join the Sustainable Materials Management (SMM) listserv to get updates and webinar announcements from EPA!
EXIT

The Facts and Figures data looks at generation, recycling, composting, combustion with energy recovery, and landfilling for a variety of materials and products. Check out our A to Z Directory for terms and keywords for which our web visitors frequently search.

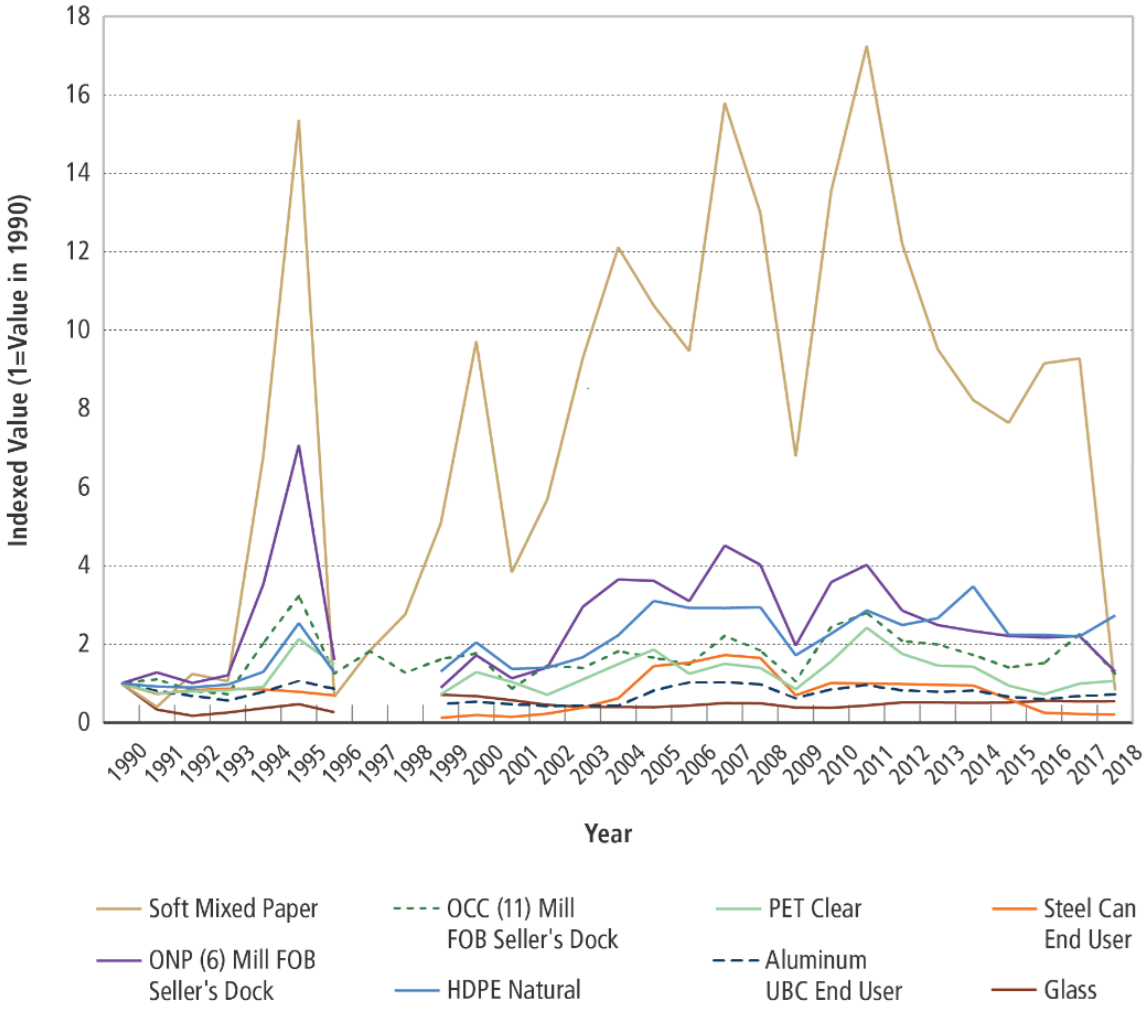


- What's Included and Key Definitions
- Frequent Questions about This Data
- Report and Data Tables
- State and Local Data
- Recycling Economic Information Report

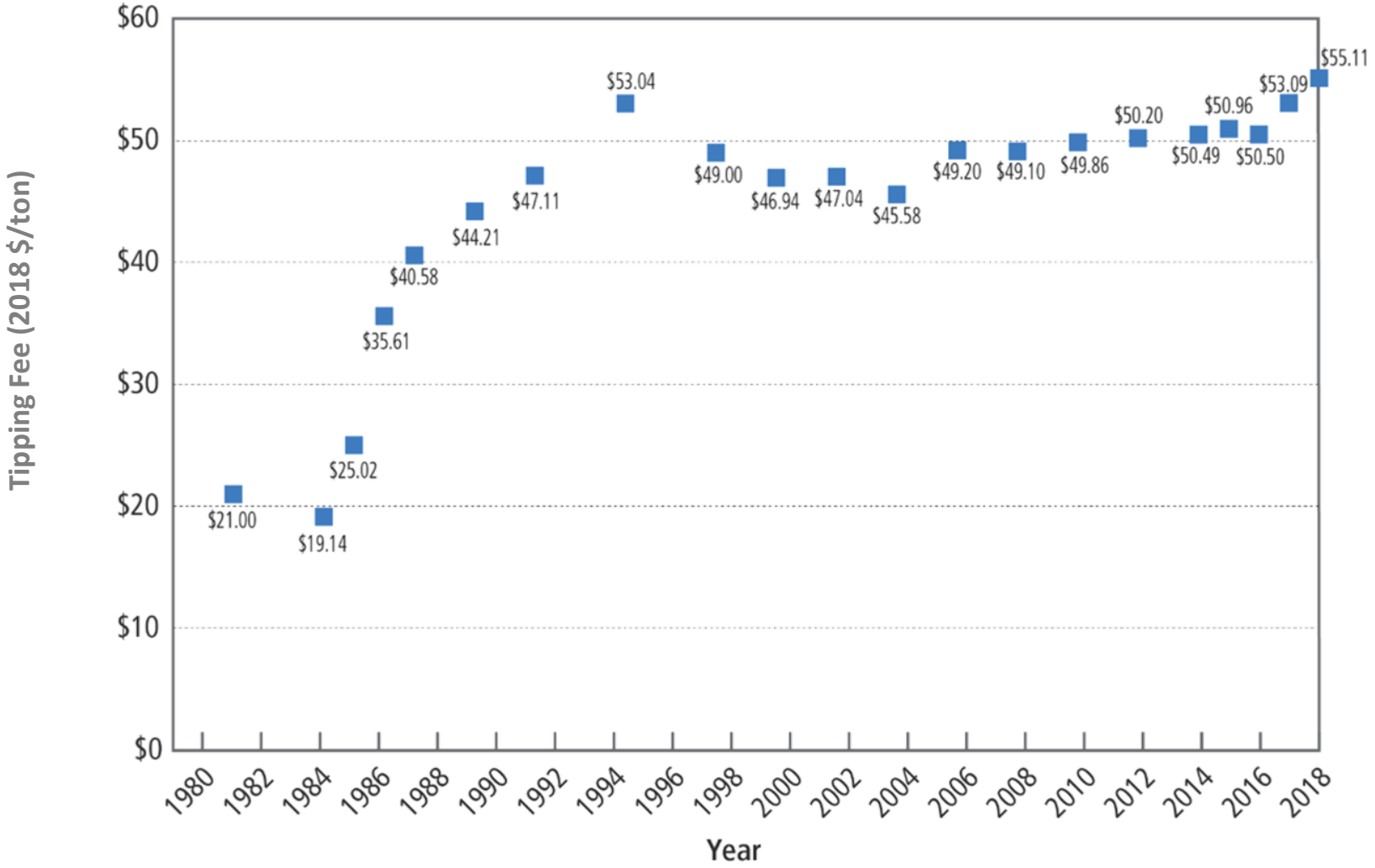
- The Current National Picture
- Generation
- Recycling/Composting
- Combustion with Energy
- Landfilling

- Containers and Packaging
- Electronics
- Food
- Construction and Demolition Debris
- All Materials and Products

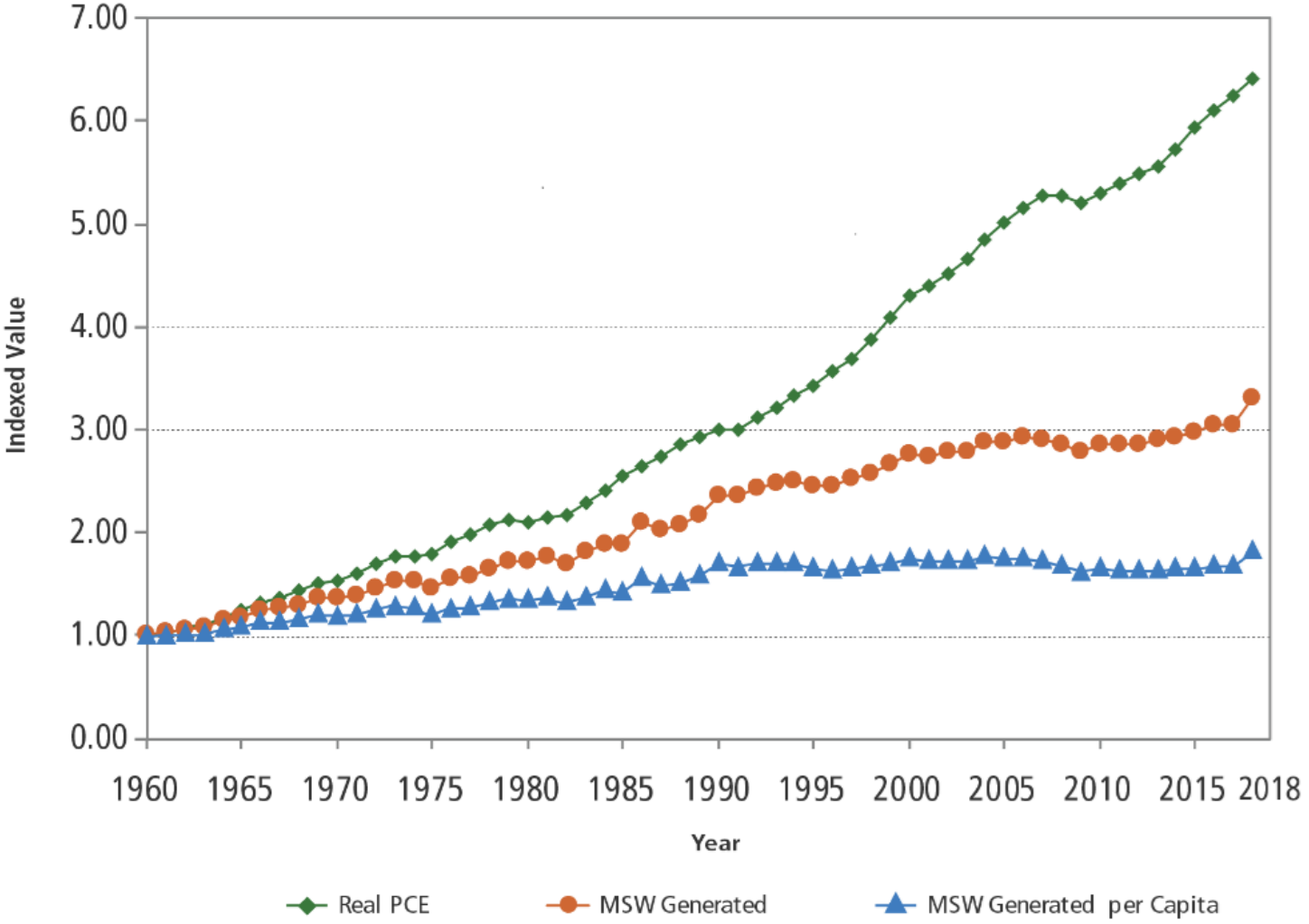
Recycled Commodity Values 1990 - 2018



National Landfill Tipping Fees 1982-2018



Personal Consumer Expenditures 1960-2018



Recycling Economic Information (REI) Methodology Report

November 2020

EPA United States Environmental Protection Agency

Recycling Economic Information (REI) 2020 Study

- Updated EPA's 2016 REI Study and compared the results
  - Source data from U.S. Census Statistics of U.S. Businesses (SUSB) now reflect 2012 data vs. 2007
- Measured the economic impacts of recycling for 2012, including estimates for jobs, wages and tax revenue
- Used a Waste Input-Output (WIO) model that distinguishes recycling/recyclable material flows within economic sectors

REI Methodology

- Waste Input-Output (WIO) Model:

  – Augments national input-output table by the Bureau of Economic Analysis (BEA) statistics distinguishing:
    - Flows of recyclables;
    - Flows of recycled products/materials; and
    - Recycling industries.

  – Nine major material categories
    - Ferrous metals, Aluminum, Paper, Glass, Plastics, Rubber, Electronics, Construction & Demolition and Organics

REI Methodology (cont.)

Delineates activities as direct or indirect

- **Direct activities:** associated with the transformation of recyclable materials into marketable products
- **Indirect activities:** associated with recycling, reuse, and food donation include the value chain of direct processes
- **Total impacts approach**

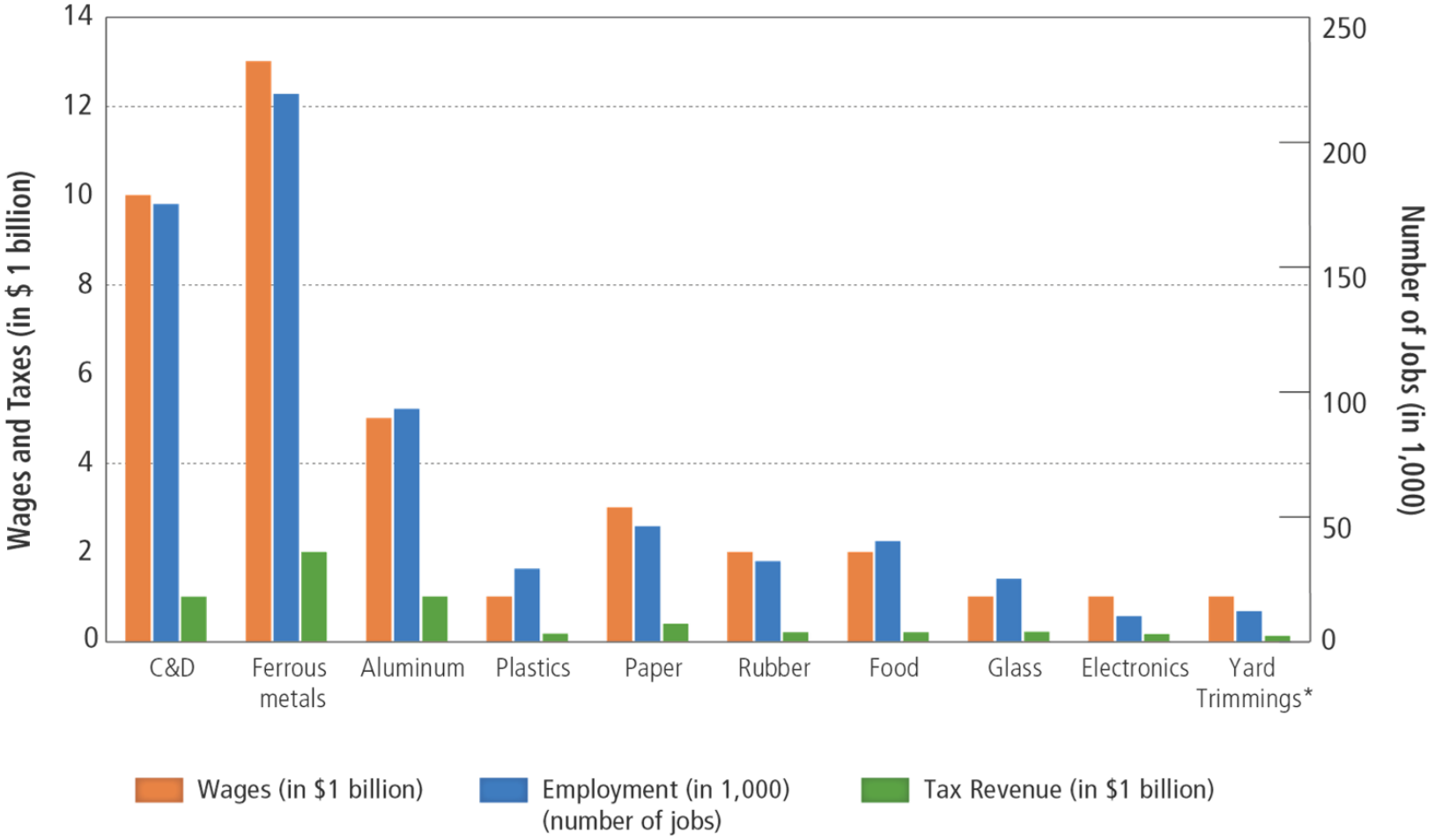
2020 REI Summary

- Recycling accounts for:
  - 681,000 jobs
    - 1.17 jobs per 1,000 tons
  - $37.8 billion in wages
  - $5.5 billion in tax revenues

- Most significant contributors to the national economy:
  - Metals (ferrous and non-ferrous)
  - Construction and demolition (C&D)

- Detailed benchmark IO statistics are updated roughly every five years

2020 REI Summary



* Yard Trimmings category includes biodiesel, biogas, compost, mulch and wood chips

REI – Key Takeaways

- Recycling is good for the environment *and* the economy
- Jobs, wages, and government tax revenues
- Direct vs. indirect activities
- Waste input-output model separates out recycling activities within sectors

Public Comment Period – Recycling Rate

Purpose: Inform the methodology and identify key data points that EPA may include when calculating the national recycling rate.

- Sources of recycled material
- Material streams
- Material management pathways
- Material destinations

Information on the public comment period can be found at https://www.epa.gov/americarecycles/national-recycling-goal-recycling-rate-measurement-comment-period

Comments will be submitted to ORCRMeasurement@epa.gov and will be added to docket # EPA-HQ-OLEM-2020-0443.

Comments will be accepted until 11:59 PM ET on March 8, 2021

Contact Information

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Questions?

For more information:

Facts and Figures
https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling

REI:
https://www.epa.gov/smm/recycling-economic-information-rei-report

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