Alternative Metrics and Methods for 21st Century Waste Management

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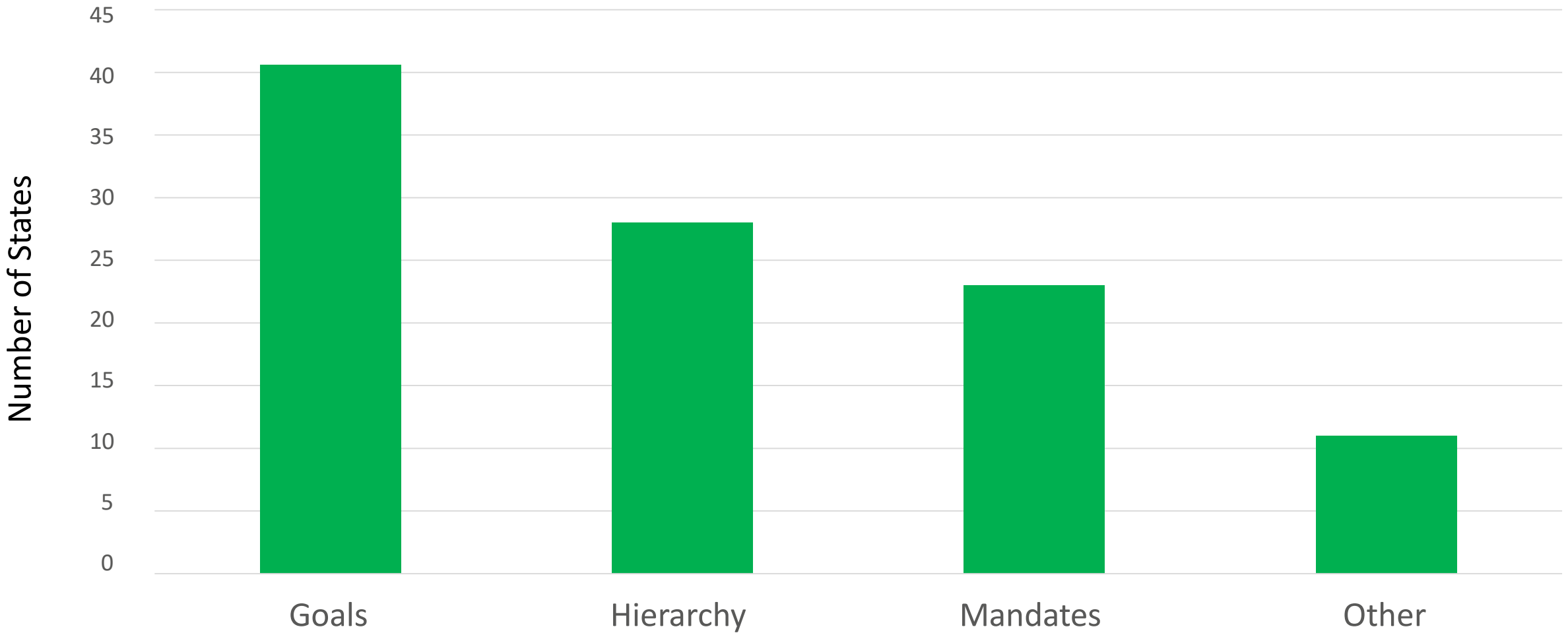
Key Drivers of State Programs



Waste Hierarchy

- Goal is set at one tier – Recycling
- What about:
  - Source Reduction & Reuse
  - Landfilling (Zero Waste)

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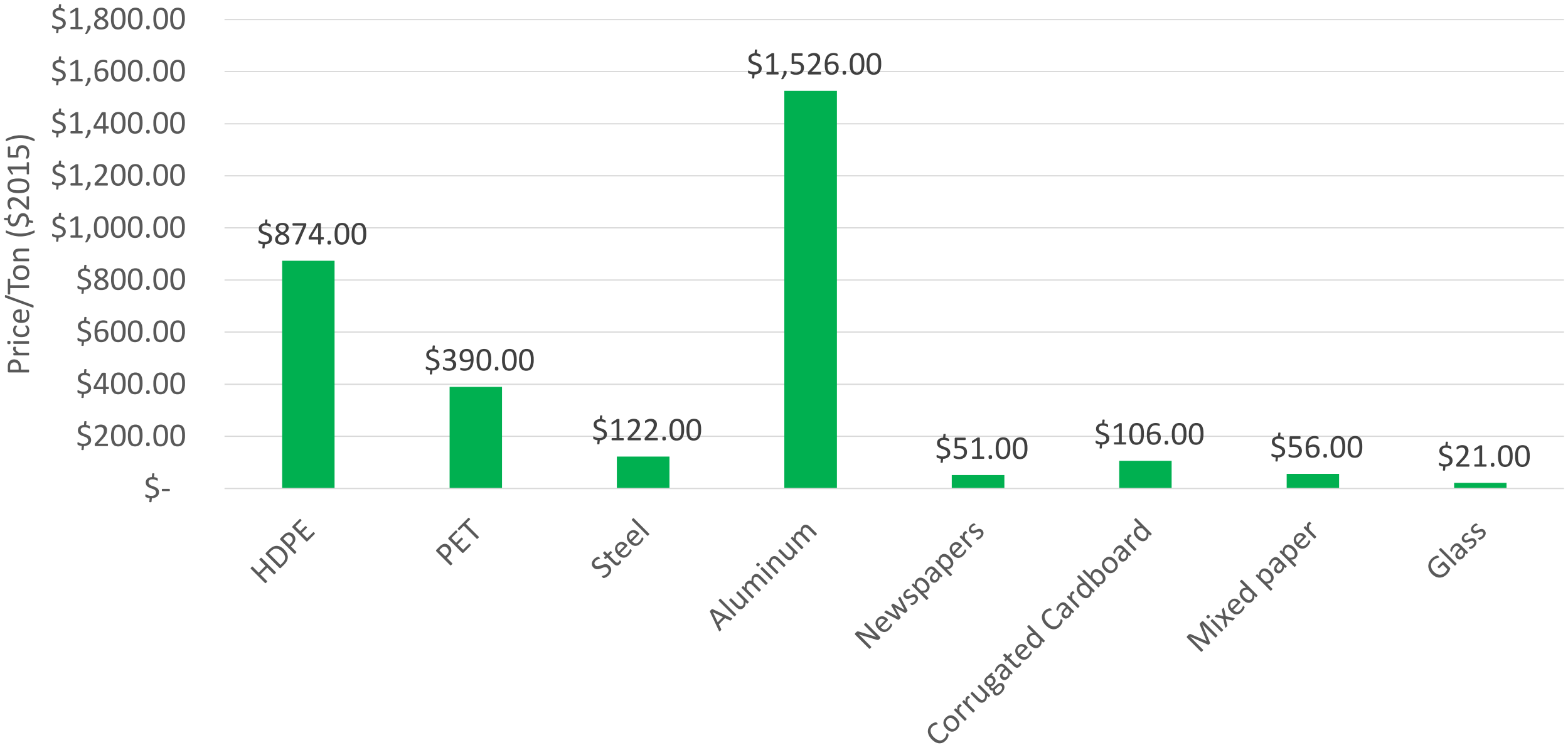
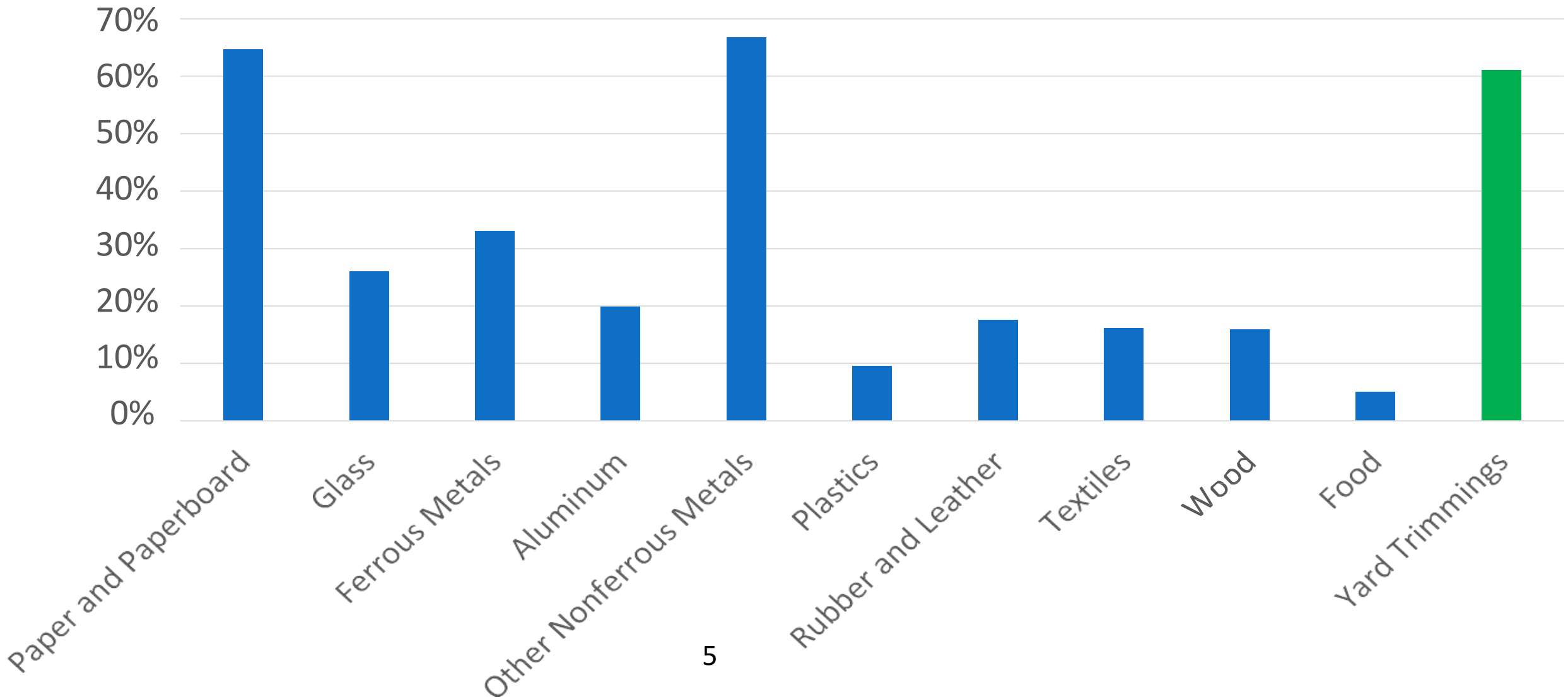
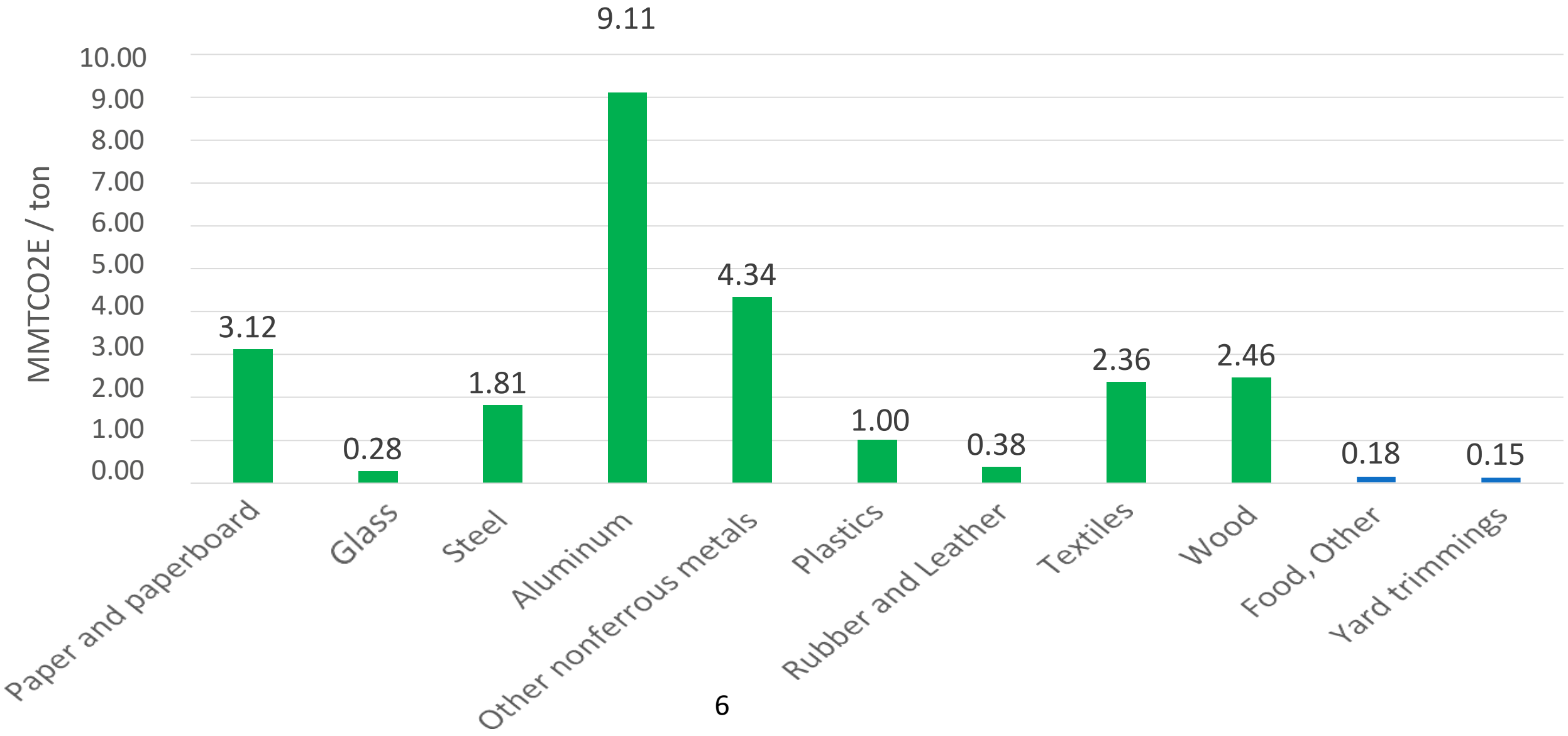
Measurement Focus: Commodity Value ($)



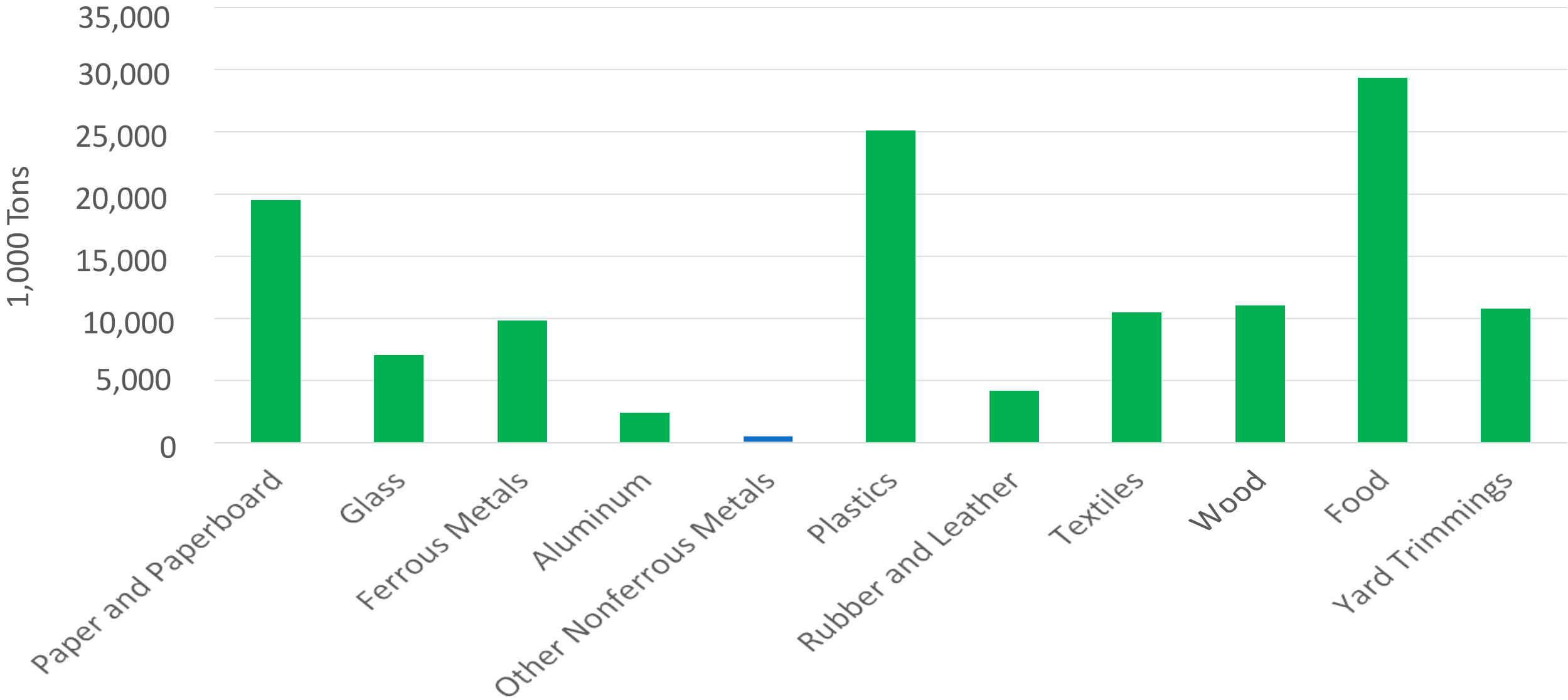
Measurement Focus: Recycling Rates



Measurement Focus: GHGs



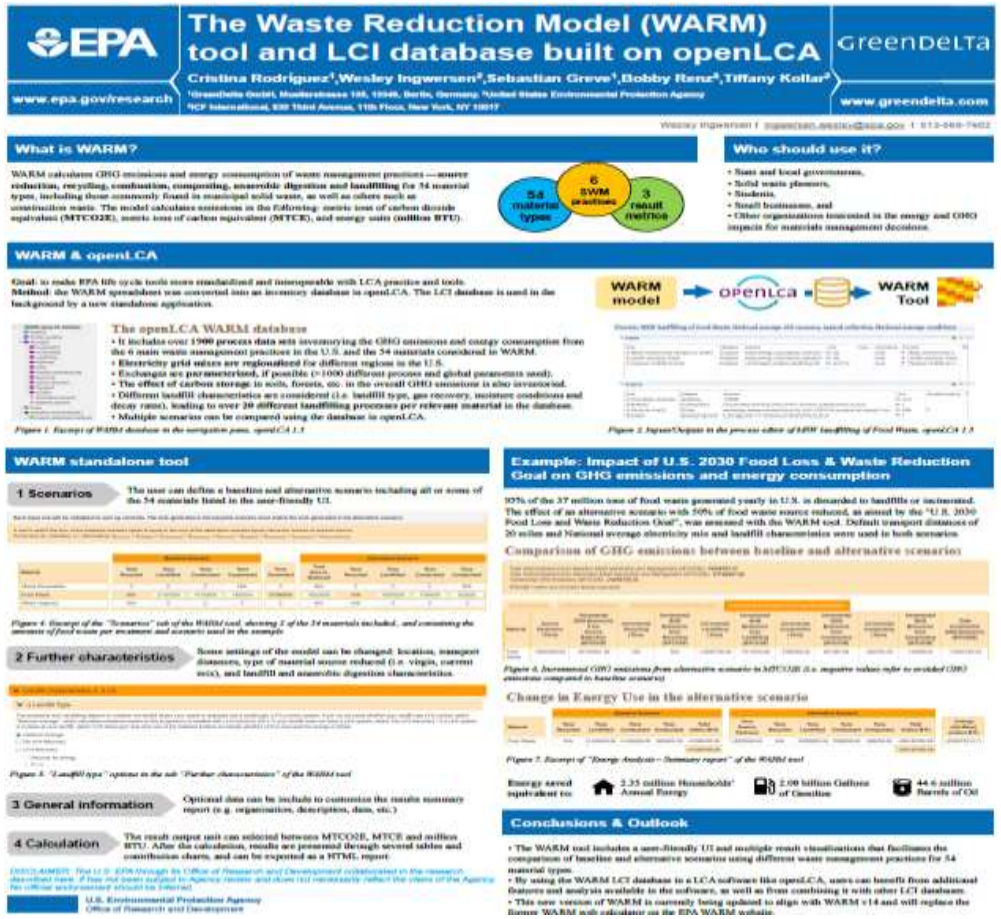
Measurement Focus: Tons Landfilled



Measurement Focus: Multi-Attribute

Rank	Goods & Services	HHCan	HHNonCan	HHResp	EcoTox	GWrm	OzDepl	Smog	Acid	Eutro	Energy	Land	Water	Matl	Waste	Rank Value
1	Electric power generation, transmis…	6.9	3.0	14.3	1.3	15.1	<1	11.7	15.8	1.2	12.8	<1	14.4	2.0	1.5	35.4
2	Residential permanent site single- …	3.7	3.7	3.5	2.2	3.1	2.0	4.6	2.3	<1	4.1	5.9	1.6	16.1	9.2	22.0
3	Animal (except poultry) slaughterin…	<1	<1	2.8	<1	2.3	<1	1.1	3.9	4.3	1.1	15.4	3.2	<1	7.6	18.8
4	Poultry processing	<1	<1	<1	<1	<1	<1	<1	1.6	16.2	<1	1.3	1.1	<1	3.7	16.8
5	Waste management and remediation se…	6.0	6.6	<1	12.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	15.2
6	Greenhouse, nursery, and floricultu…	<1	<1	3.3	<1	<1	14.1	<1	<1	<1	<1	<1	<1	<1	<1	14.5
7	Food services and drinking places	3.9	3.3	3.2	3.1	3.4	2.1	2.8	3.1	3.9	3.8	4.0	5.6	1.0	6.7	14.2
8	Light truck and utility vehicle man…	5.9	9.6	1.2	5.0	2.1	3.1	1.9	1.2	<1	1.7	<1	<1	<1	2.6	13.5
9	Retail trade	4.4	4.5	3.4	4.7	3.9	3.2	3.8	3.3	1.6	4.9	1.7	3.4	<1	3.7	13.4
10	Truck transportation	<1	<1	1.3	<1	<1	<1	8.9	3.0	<1	2.9	<1	<1	<1	<1	9.9

WARM version 14 in openLCA



WARM openLCA (v14)

- Same functionality as WARM version 14 Excel
- Database vs. Excel spreadsheet
- Interoperable data
- Flexible for future updates

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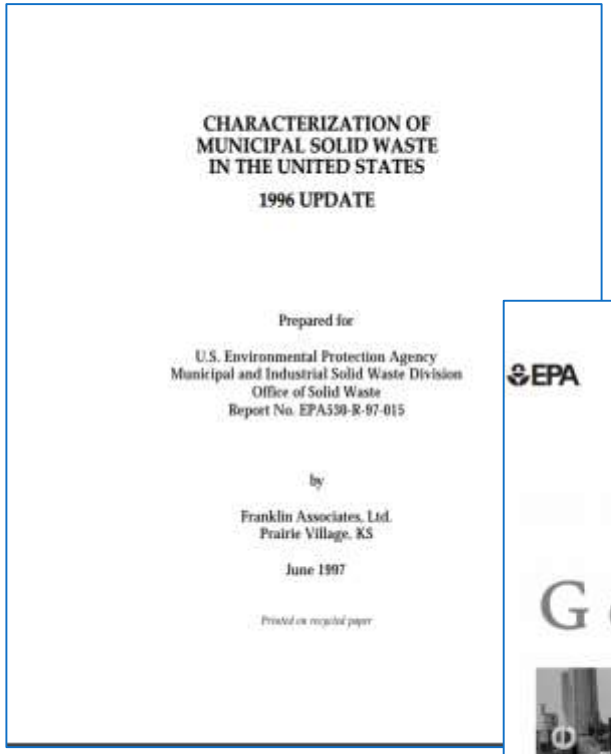
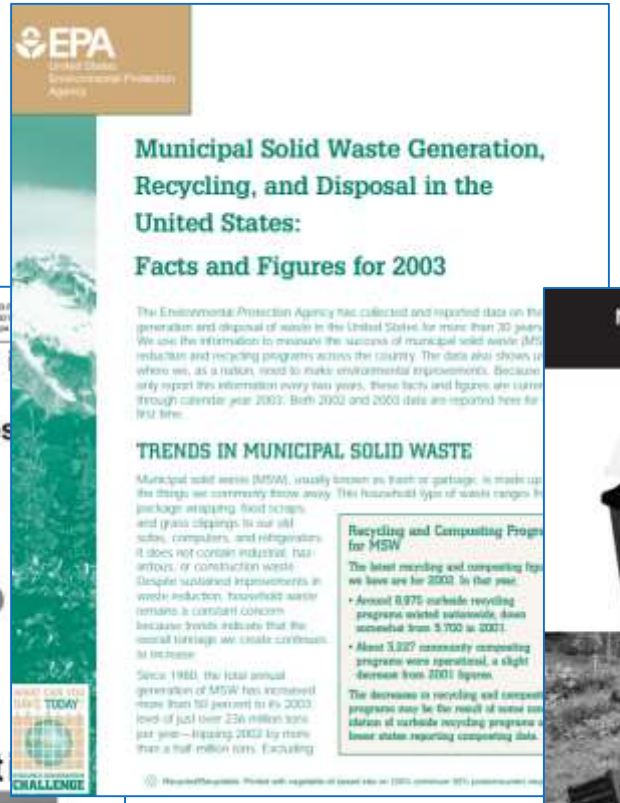
EPA Facts & Figures





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EPA United States Environmental Protection Agency

www.epa.gov/smm

Recent Report Enhancements

- Replaced recovery and disposal with generation, recycling, combustion and landfilling.
- Methodology updates for electronics and construction and demolition (C&D).
- Per Capita vs PCE comparison

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2018 Transition to the Web

Facts and Figures About Materials, Waste and Recycling

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Learn about the Facts and Figures

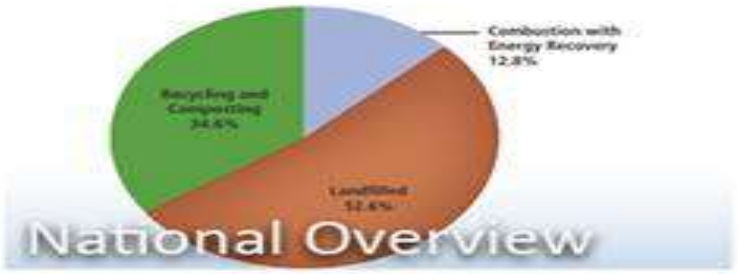
- Materials
- Products

NOTE:
Current statistics reflect data from 2014. Data is only representative of the United States.

EPA expects to update this information with 2015 data in 2018.

Set

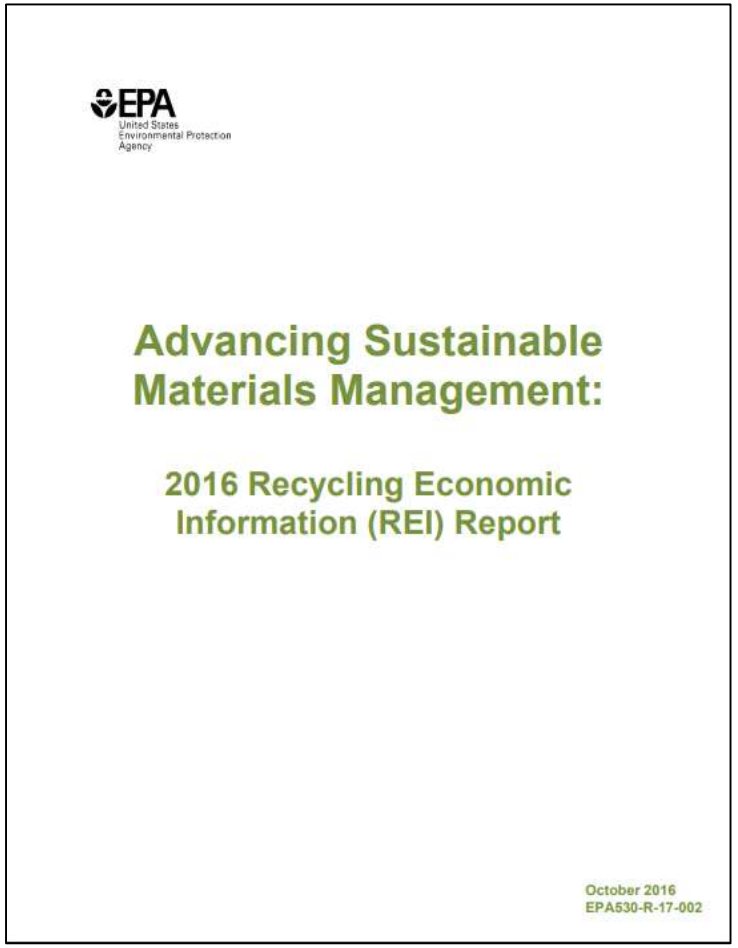
The Facts and Figures data looks at generation, recycling, composting, combustion with energy recovery and landfilling for a variety of materials and products. View our A to Z Directory.



Recycling Economic Information (REI) Report

- Recycling accounts for:
  - 757,000 jobs
    - 1.57 jobs per 1,000 tons
  - $36.6 billion in wages
  - $6.7 billion in tax revenues

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



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Scoping Work in Progress: Industrial Materials

- **Studying five different categories of non-hazardous industrial materials:**
  - Coal Combustion Residuals (CCRs), Iron and Steel Slag, Spent Foundry Sands, Mining, Mineral Processing, and Biosolids
- **Utilizing publicly available data:**
  - Government sources
  - Industry Trade Associations
  - Academic Papers
- **Current status:**
  - Investigating data source
  - Tentative estimations by the end of the 2018

Recycling System Performance Measures

- Capacity (Collection, Processing, & Reutilization)
- Utilization of Capacity (Participation Rate & Capture Rate)
- Contamination (Collection & Final Bale)
- Processing Efficiency & Effectiveness (Yield, Loss, Residual)
- Economics (Market Value, Collection & Processing Costs)

Thank you!

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