

Recycling: the Business Case

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December 2016

*Container
Recycling
Institute:*

*Striving to make
North America a
global model for
the collection
and quality
recycling of
packaging
materials.*



About CRI

CRI's mission is to make North America a global model for the collection *and* quality recycling of packaging materials. We do this by:

- Creating and maintaining a database on containers and packaging
- Studying container and packaging reuse and recycling options and legislation, including deposit systems, and their environmental and economic impacts
- Educating on recycling options for government, elected officials, for citizen groups, the print and broadcast media, publications and industry groups
- Creating national networks

How can we.....?

- Collect the *MOST* materials?
- At the highest *QUALITY* levels, so that they can be made into products again?
- At the *LOWEST COST*?

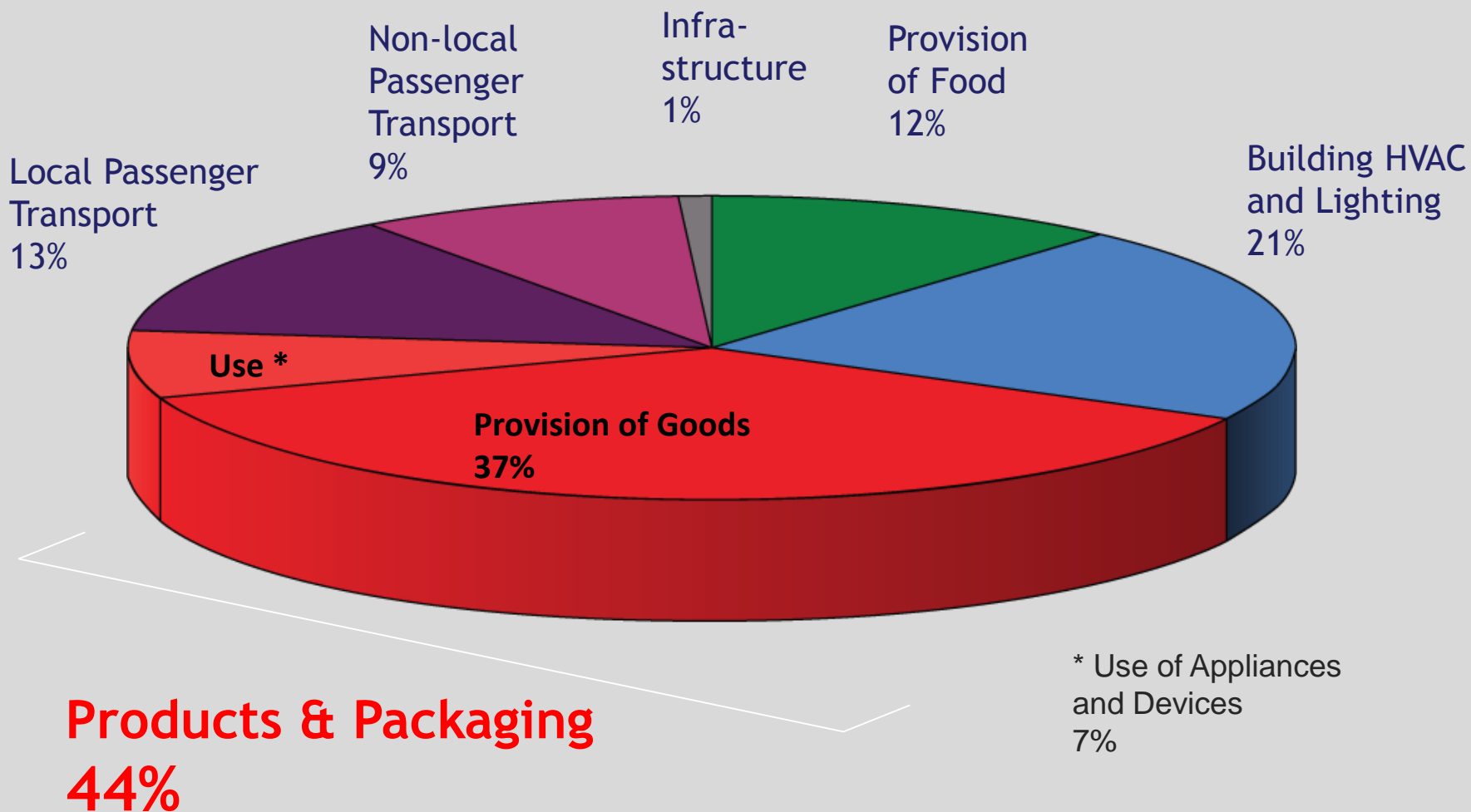


Why Recycling is Important

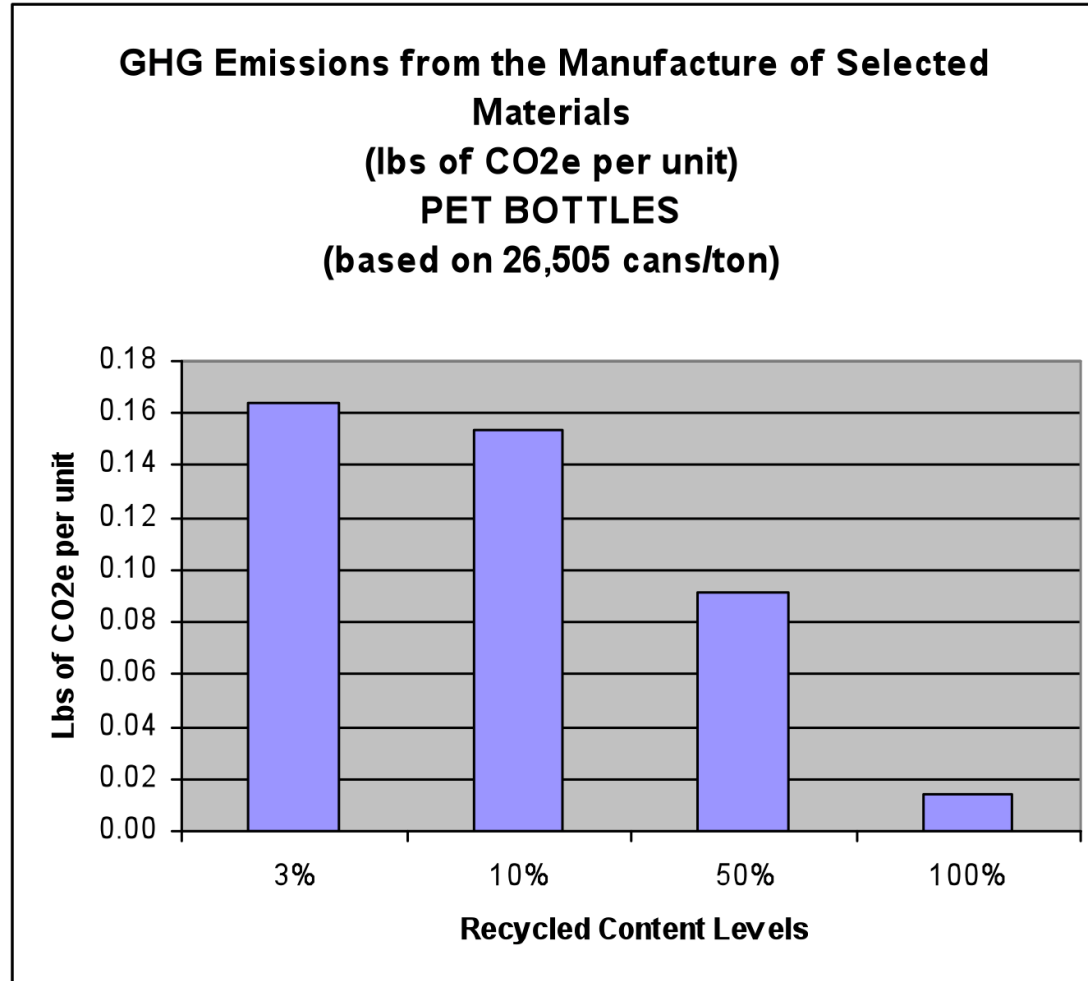
Recycling is More Than Just Diversion From Disposal

- Upstream environmental benefit: 10 to 20 times greater than downcycled or disposal options.
- When a product is made from recycled material, the use of virgin materials is not required.
 - Extraction, transport and processing of virgin materials is avoided
- This avoids the upstream energy and associated environmental impacts
- Weight is not an indication of environmental footprint

US Greenhouse Gas Emissions Consumption View - Global



Recycled Content for PET Bottles: 3%, 10%, 50% and 100%

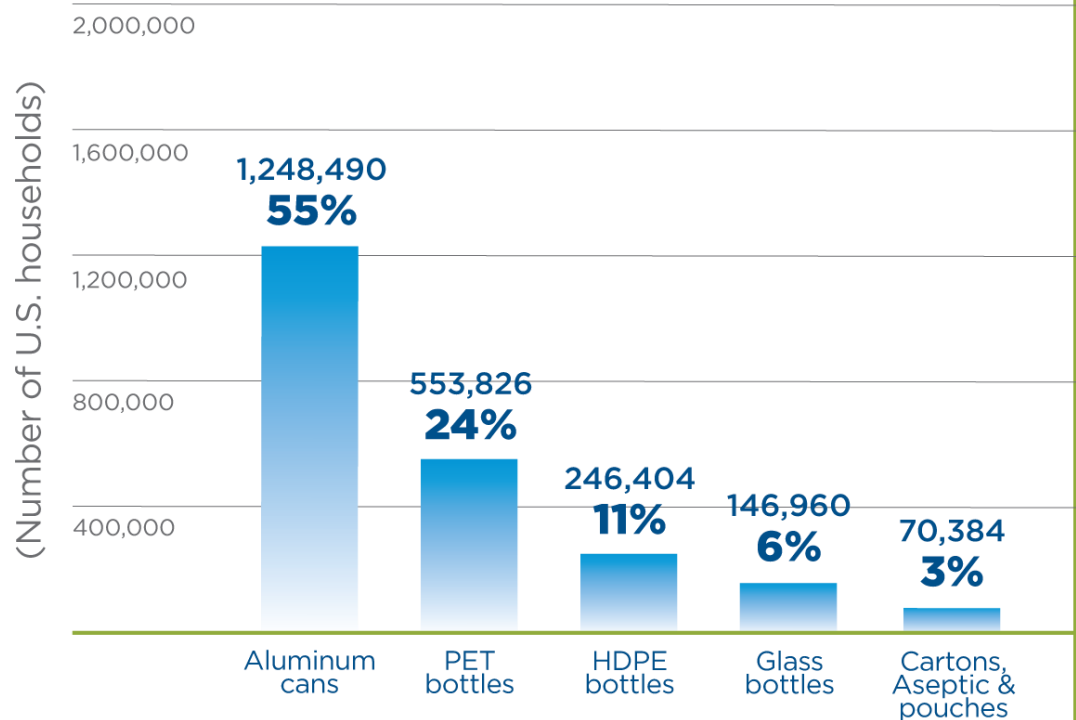


Energy Impacts of Wasting

- In total, about **2.3 million American homes** could have all their energy needs met (heating & cooling, cooking, utilities, etc.) with the amount of energy required to replace the containers wasted in 2010.

Energy Required to Replace Wasted Beverage Containers, 2010

(in U.S. household equivalents)



Assumes 89.6 MBtu per household per year. See further notes and sources in Appendix B.

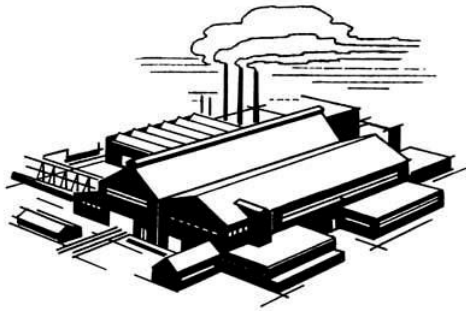
© Container Recycling Institute, 2013

Materials Collection and Processing

1. Collection



2. MRF



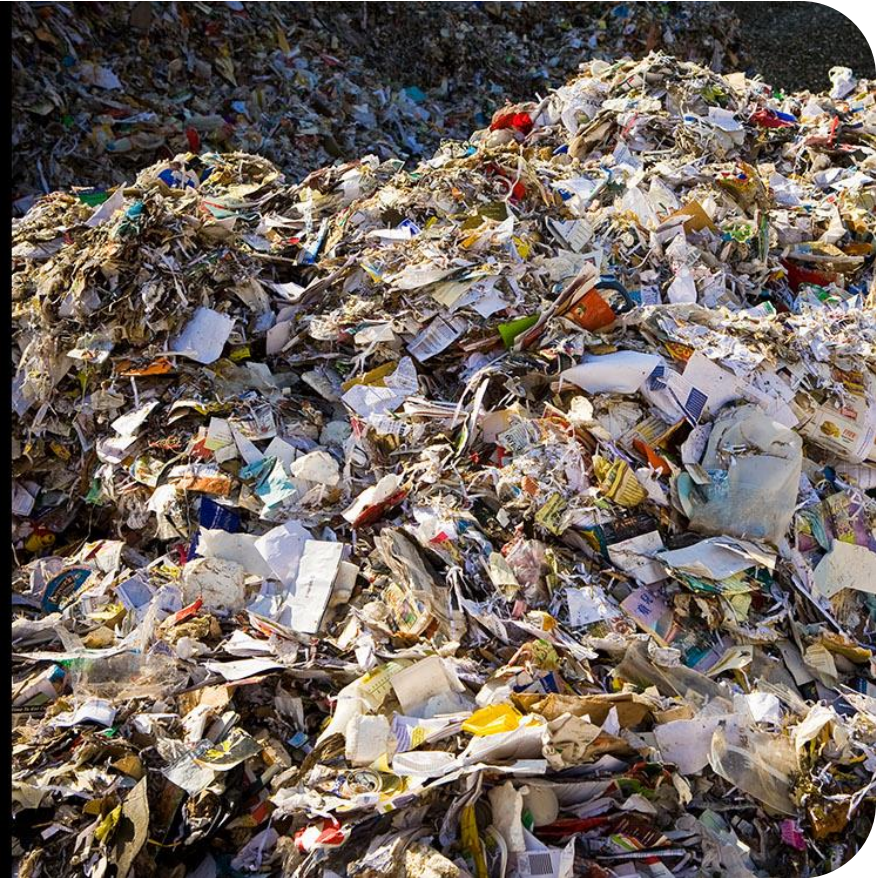
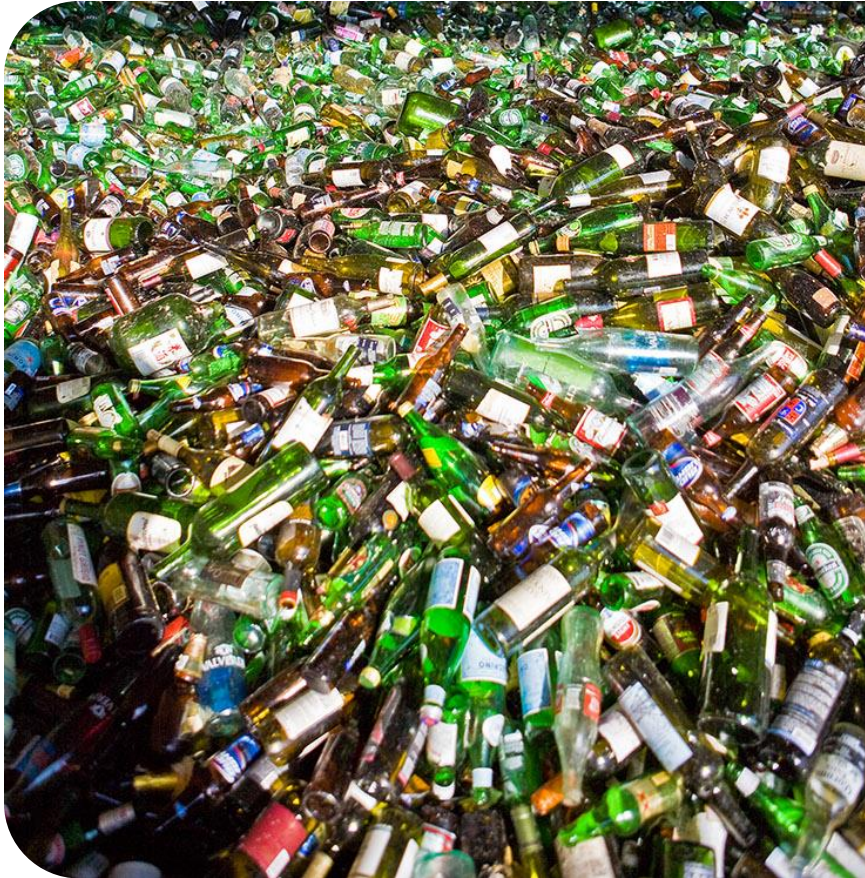
3. Post-MRF Processing



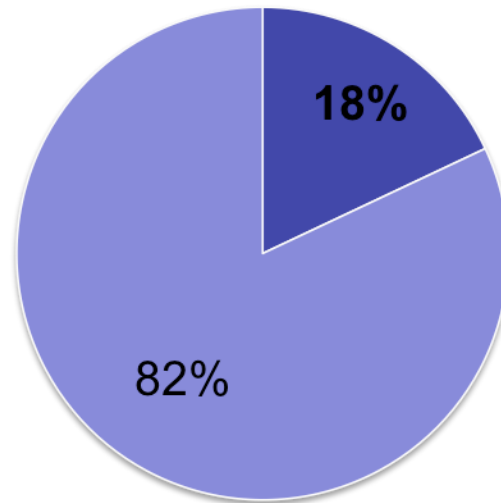
4. Manufacture Into New Products



Deposit vs. Single Stream Glass



Paper



■ **Losses** ■ Actually Recycled

Paper mills that receive materials from single-stream MRFs have contamination rates that average 15 - **18** percent.

Paper Mill – Incoming Mat'l (1)



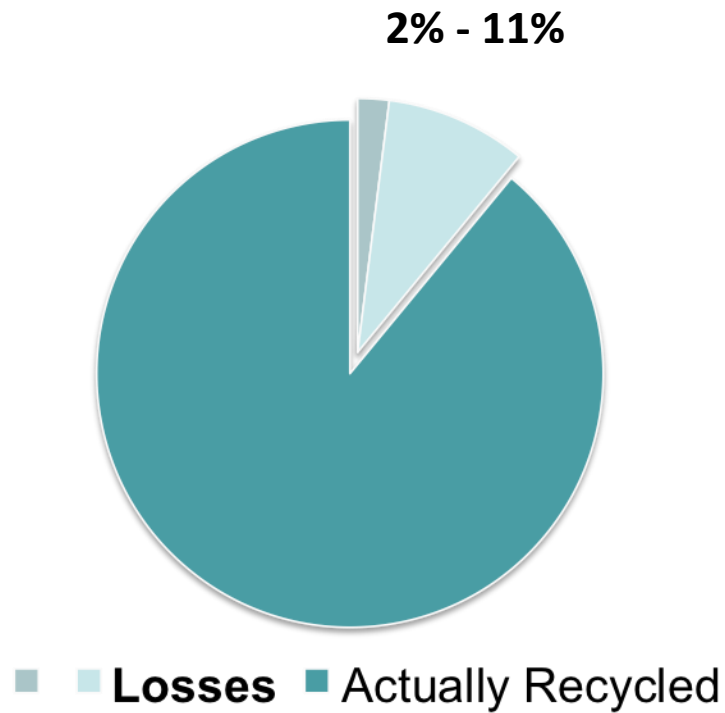
Paper Mill, Contamination to Landfill (1)



Paper Mill, Contamination to Landfill (3)

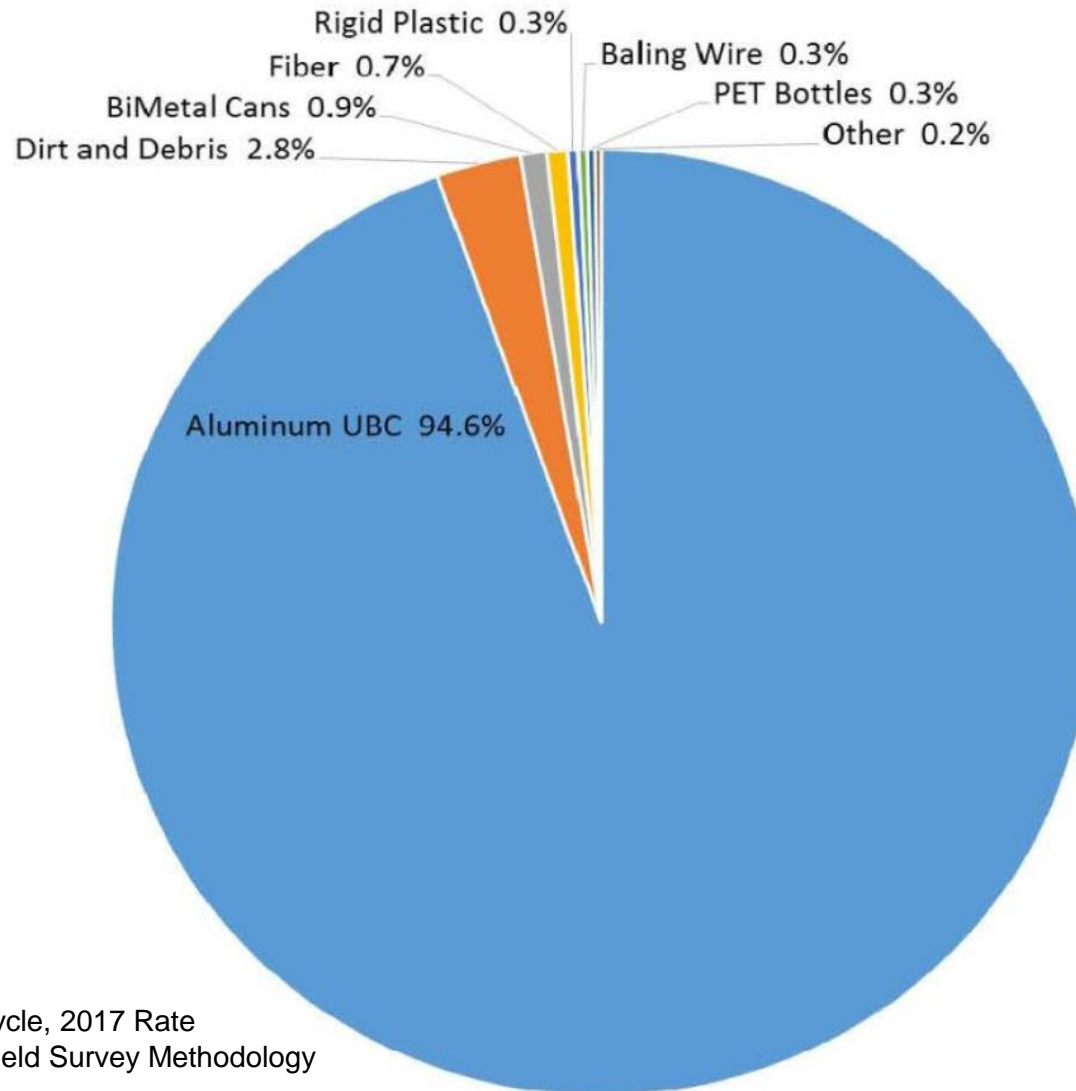


Aluminum



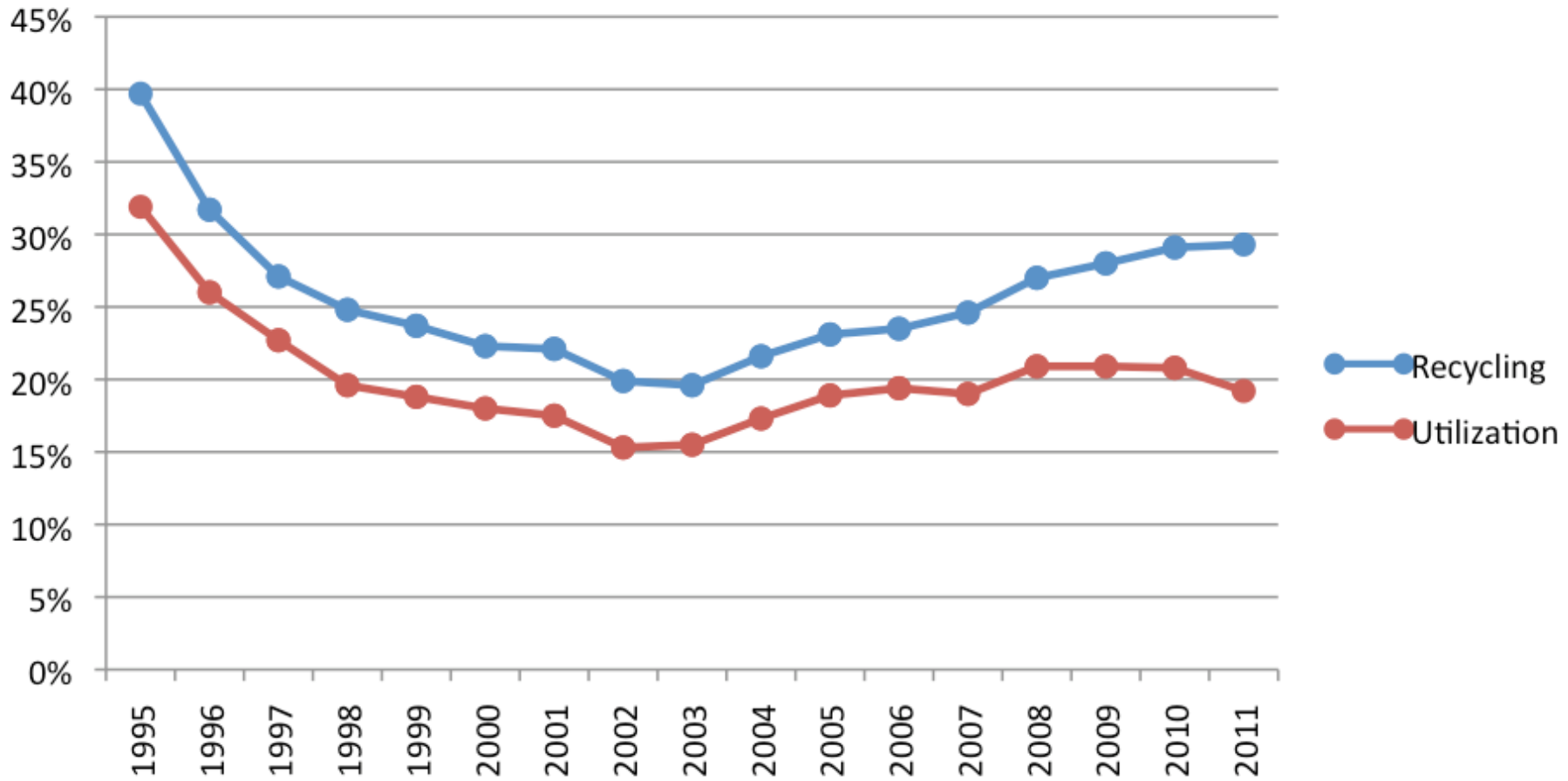
Single-stream contamination rate of aluminum ranges from **2** to **11** percent.

Aluminum UBC Bale Composition (% by weight)

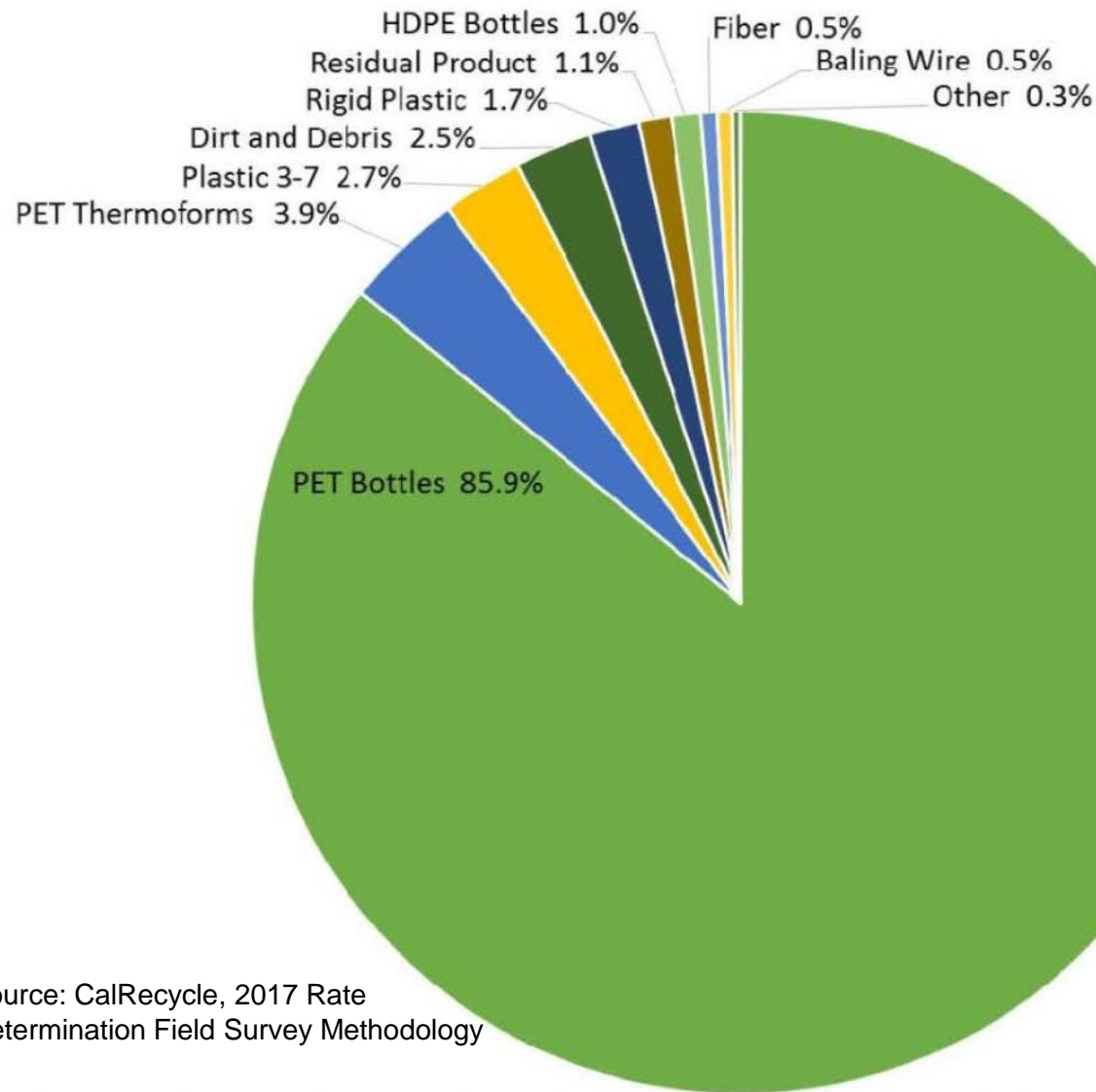


Source: CalRecycle, 2017 Rate
Determination Field Survey Methodology

PET Recycling vs. Utilization Rates in the U.S., 1995-2011



PET Bale Composition (% by weight)



n = 11

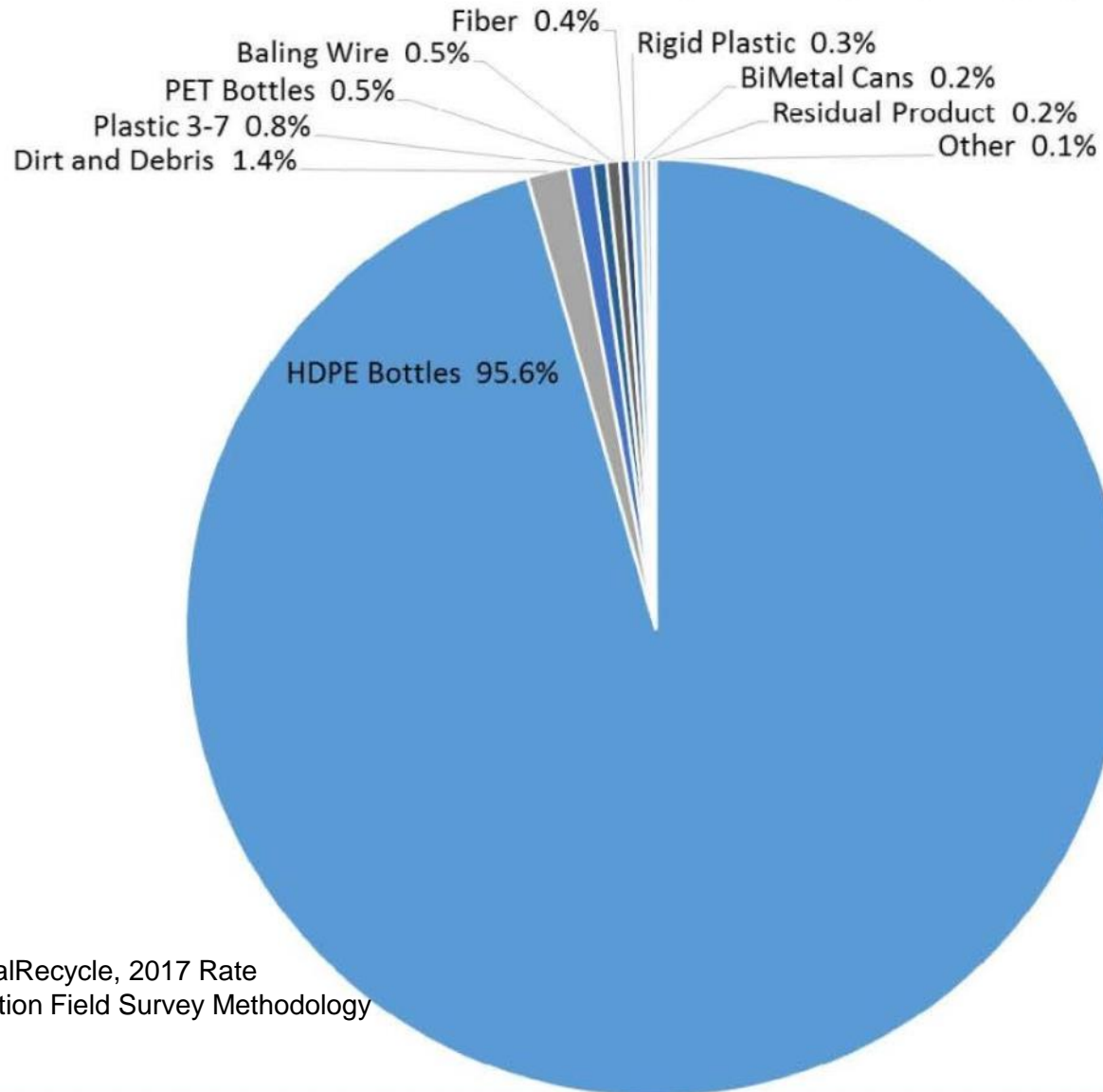
Avg 85.9%

Min 53.1%

Max 95.0%

Source: CalRecycle, 2017 Rate
Determination Field Survey Methodology

HDPE Natural Bale Composition (% by weight)



n = 9

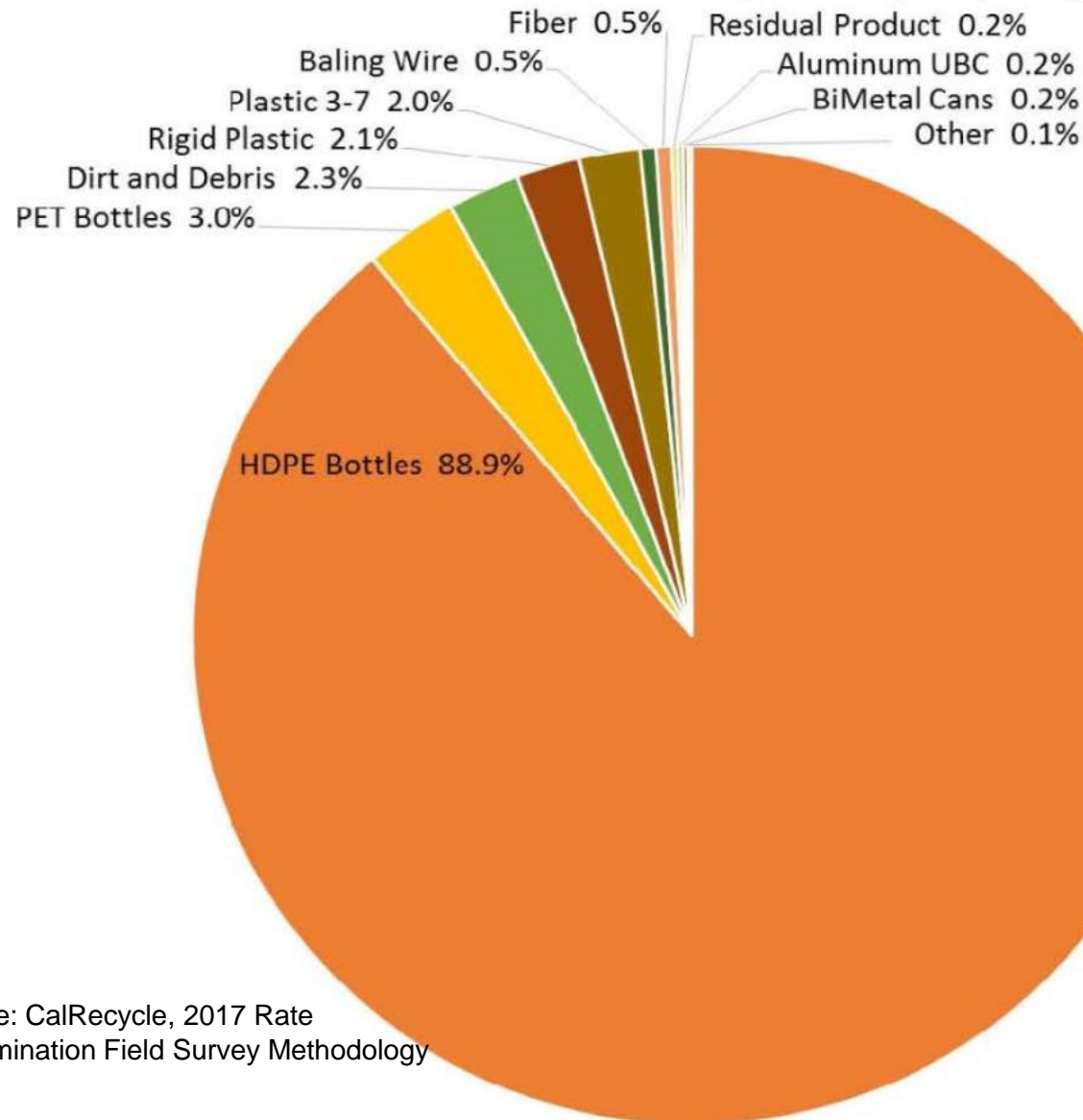
Avg 95.6%

Min 83.6%

Max 98.5%

Source: CalRecycle, 2017 Rate
Determination Field Survey Methodology

HDPE Colored Bale Composition (% by weight)



Source: CalRecycle, 2017 Rate
Determination Field Survey Methodology

n = 9
Avg 88.9%
Min 77.3%
Max 96.2%

Single Stream Collection

On average 75% of recyclables collected in single stream programs are recycled into new products.



100 tons of
recyclables

25 tons

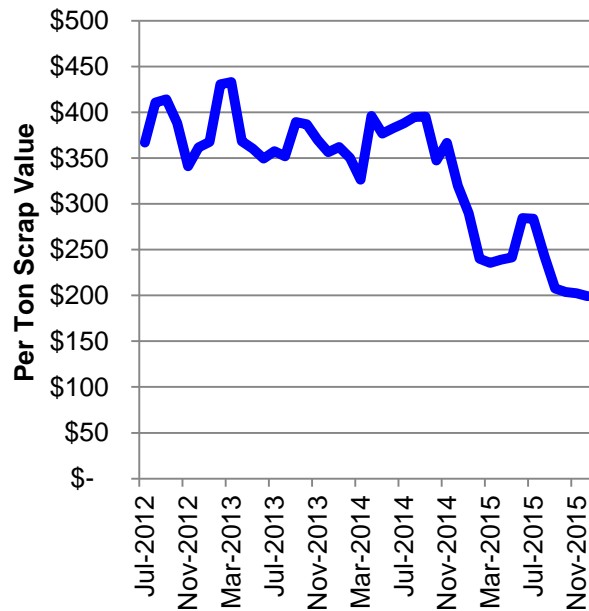
Landfilled



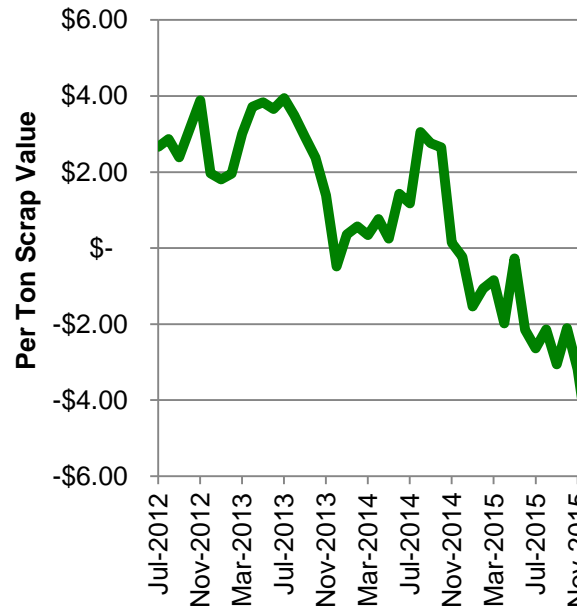
Scrap values trending down since 2012: all three major container materials

Figure 2: Actual Scrap Values, July 2012 - Dec. 2015

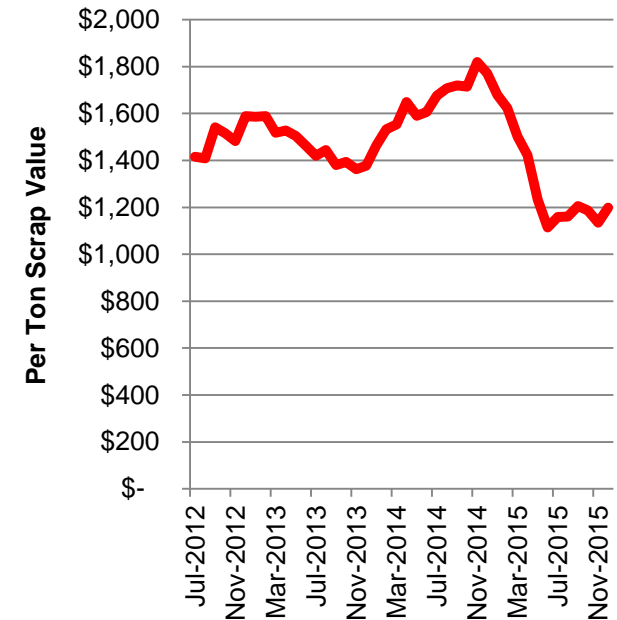
PET Plastic



Mixed Glass



Aluminum Cans



Source: CalRecycle, 2013-2015.

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As we seek new policies to increase recycling rates, we need to start reporting what is *actually* recycled, not just what is collected for recycling.

If recycling rates are reported without removing yield loss from the contamination, it can lead to inflated recycling rates and double-counting.



Recommendations

- ***Know what's really being recycled:*** Municipalities should require post-MRF contamination rates from MRFs before entering into contracts, and should continue to receive this information throughout the life of the contract
- ***Further study of collection economics:*** Correct the “cost-per-ton collected” data and start using “cost-per-ton recycled” data. This will allow for better decision-making during the procurement phase.
- ***Research best practices:*** More examples of successful dual-stream and multi-stream collection programs that maximize actual recycling while minimizing costs

Cost Metrics: Hypothetical

Cost Metric	Value
Cost Per Ton Collected	\$100
Cost per “Recovered” Ton, if 8% residual	\$109
Cost per Ton that is Actually Made into a Manufactured Product, 75%(replacing virgin material input)	\$133



Follow your Materials

Why This is Important

- ***Getting what you paid for***
- ***Reputational Risk:***

Risk to reputation of company with
consumers/clients

Employee engagement

Recommendations

- ***Add language on material quality to RFP***

Request history of quality reports

- ***Add language to contracts***
- ***Request and review quality reports, during contract period***

City of Los Angeles

- ***New Process Underway***
- ***Facilities:*** Must be certified
- ***Contracts:***
Will have provisions for better material reporting
- ***Goal:*** Higher quality materials create better jobs locally

Contract Definitions from Santa Fe

- **Recycling:** “Means any process by which recyclable materials are collected, separated, processed and reused or returned to use in the form of raw materials or products.”
- **Residual:** “Means a portion of acceptable recyclable materials that is not MRF processed (i.e., separate, sorted). Residual is not the same as Contamination.”
- **Contamination:** “Means non-recyclable materials mixed in with acceptable recyclable materials in a commingled, or single stream recycling program. Contamination is also considered out-throws during MRF processing.”
- **Processing:** “....does not include incineration....”

Dual-Stream Cart From Sunnyvale



Dual-Stream Cart From Sunnyvale



Germany – Public Collection of Glass



Collecting glass: Recommendations

Drop-off points



- ▶ 1 per 20,000 residents
- ▶ Easily accessible
- ▶ Visible



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Thank You!