Recycling: the Business Case

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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

- **Provision of Goods**: 37%
- **Local Passenger Transport**: 13%
- **Non-local Passenger Transport**: 9%
- **Building HVAC and Lighting**: 21%
- **Use**: 7%
- **Provision of Food**: 12%
- **Infrastructure**: 1%

Products & Packaging: 44%

Source: PPI 2009 – Joshuah Stolaroff
Recycled Content for PET Bottles: 3%, 10%, 50% and 100%

GHG Emissions from the Manufacture of Selected Materials
(lbs of CO2e per unit)
PET BOTTLES
(based on 26,505 cans/ton)
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.
Materials Collection and Processing

1. Collection
2. MRF
3. Post-MRF Processing
4. Manufacture Into New Products

PET
Deposit vs. Single Stream Glass
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)
Single-stream contamination rate of aluminum ranges from 2 to 11 percent.
Aluminum UBC Bale Composition (% by weight)

- Rigid Plastic: 0.3%
- Fiber: 0.7%
- BiMetal Cans: 0.9%
- Dirt and Debris: 2.8%
- Baling Wire: 0.3%
- PET Bottles: 0.3%
- Other: 0.2%

Aluminum UBC: 94.6%

n = 11
Avg: 94.6%
Min: 85.6%
Max: 98.8%

Source: CalRecycle, 2017 Rate Determination Field Survey Methodology
PET Recycling vs. Utilization Rates in the U.S., 1995-2011

© Container Recycling Institute, 2013
Source: CalRecycle, 2017 Rate Determination Field Survey Methodology

PET Bale Composition (% by weight):

- PET Bottles: 85.9%
- PET Thermoforms: 3.9%
- Plastic 3-7: 2.7%
- Rigid Plastic: 1.7%
- Residual Product: 1.1%
- Dirt and Debris: 2.5%
- HDPE Bottles: 1.0%
- Fiber: 0.5%
- Baling Wire: 0.5%
- Other: 0.3%

n = 11
Avg: 85.9%
Min: 53.1%
Max: 95.0%
Source: CalRecycle, 2017 Rate Determination Field Survey Methodology

HDPE Bottles 95.6%

- Baling Wire 0.5%
- Fiber 0.4%
- Rigid Plastic 0.3%
- BiMetal Cans 0.2%
- Residual Product 0.2%
- Other 0.1%
- PET Bottles 0.5%
- Plastic 3-7 0.8%
- Dirt and Debris 1.4%

n = 9
Avg 95.6%
Min 83.6%
Max 98.5%
Source: CalRecycle, 2017 Rate Determination Field Survey Methodology

n = 9
Avg  88.9%
Min  77.3%
Max  96.2%
In the average single-stream collection program, if you collect 100 tons of recyclables at the curb, on average 75 tons will actually be recycled into new products, and most of the rest will be landfilled.
Scrap values trending down since 2012: all three major container materials

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

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

<table>
<thead>
<tr>
<th>Cost Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Per Ton Collected</td>
<td>$100</td>
</tr>
<tr>
<td>Cost per “Recovered” Ton, if 8% residual</td>
<td>$109</td>
</tr>
<tr>
<td>Cost per Ton that is Actually Made into a Manufactured Product, 75% (replacing virgin material input)</td>
<td>$133</td>
</tr>
</tbody>
</table>
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

www.rippleglass.com
To Get More Information

Visit us at...

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Container.Recycling

container-recycling.org

bottlebill.org

(310) 559-7451
Thank You!