Impacts of Single Stream Recycling
Challenges to the Evolving Recycling Stream

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About ISRI

1,700 Member companies
7,000+ Recycling facilities worldwide
34 Countries
Industry Snapshot: $90 Billion Industry in U.S.

135,000,000
Tons processed annually

2013 U.S. Scrap Exports

42.8
Total exported (million metric tons)

$24B
Value of materials exported

160
Number of destinations exported to
ISRI Members relations with MRFs

• Some operate
  • Some buy direct
  • Some broker
Recycling history repeating itself?

Prehistoric age: Recyclables put into the trash bin
Golden age: Dual stream collection
Modern age: Single stream collection
Dark ages: “One-stream” collection

Are we headed in the right direction?
The rise of single stream

In 2005, only 29 percent of the population had access to single-stream.

In 2014, that number has grown to 80 percent*

*2014 AF&PA Community Survey
Single stream dominates

Paper/Paperboard Collection Techniques

- Two or More Streams: 70% in 2005, 49% in 2007, 34% in 2010, 18% in 2014
- Combination: 1% in 2005, 1% in 2007, 2% in 2010, 2% in 2014

“Combination” means different haulers in some communities may use different collection techniques for recycling collection.
U.S. Paper and Paperboard Recovery ~ 50 Million tons

U.S. Recovery (tons) and Recovery Rate (%) of Paper and Paperboard, 1994-2013
Source: AF&PA

- OCC
- Newprint/Mechanical Papers
- Printing-Writing Paper
- Other
- Recovery Rate (right axis)
The U.S. Recycled More than 3.5 Million Tons of Post-Industrial and Post-Consumer Plastic Scrap in 2013

Sources: American Chemistry Council, Moore Recycling Associates, ISRI estimates.
The U.S. Aluminum Industry (metric tons & %)

<table>
<thead>
<tr>
<th>Year</th>
<th>Aluminum Recovered from Scrap</th>
<th>Total Aluminum Consumption</th>
<th>Scrap Market Share (%)</th>
<th>U.S. Aluminum Scrap Exports*</th>
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</thead>
<tbody>
<tr>
<td>2009</td>
<td>3,000,000</td>
<td>5,120,000</td>
<td>59%</td>
<td>1,658,000</td>
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<tr>
<td>2010</td>
<td>2,700,000</td>
<td>5,053,000</td>
<td>53%</td>
<td>1,913,000</td>
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<tr>
<td>2011</td>
<td>3,110,000</td>
<td>5,099,000</td>
<td>61%</td>
<td>2,144,000</td>
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<tr>
<td>2012</td>
<td>3,430,000</td>
<td>5,768,000</td>
<td>59%</td>
<td>2,037,000</td>
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<tr>
<td>2013</td>
<td>3,480,000</td>
<td>6,969,000</td>
<td>50%</td>
<td>1,872,000</td>
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</table>

Sources: USGS, USITC, ISRI Estimates
*Includes Used Beverage Containers (UBCs) and Remelt Secondary Ingot (RSI).
positive impacts

higher volumes and cheaper collection costs
key challenges

More contamination, reduced quality of material

Significant “tag-along” volumes of materials, e.g. mixed rigid plastics

Less metal and paper, more plastics

Difficult plastics without markets
- Bio plastics, rigid styrene, #7, PVC
Impact of Chinese “Green Fence”

• So-called 100% inspection…but it was less

• Most metals non-impacted
  – Zorba and Zurich spot checking for circuit boards

• Paper and post-consumer plastic remain under intense scrutiny

• Used beverage containers not accepted unless cut in half and fully cleaned, concerns of infectious disease

• Industrial plastic not problematic due to quality
Impact of Chinese “Green Fence”

- Chinese and export markets do not know if the shipment is from single stream, impacts entire market
- Many single stream recyclers faced challenging times with Green Fence
- Additional staff hired to supplement mechanical
- New technologies?

U.S. Plastic Scrap Exports by Volume (metric tons) and Polymer, 2011-2014

Plastic Green Fence Rebound

Rebound of nearly 14 percent from 2013’s Operation Green Fence levels*

*Resource Recycling 2015
Final thoughts

• It’s all about the quality and markets

• Food contamination is a growing problem

• ISRI prefers a system that maximizes the amount being recycled with the highest attainable quality

• Energy recovery is not recycling

• “One-stream” is not the answer
Thank You

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