RECYCLING IS STILL BROKEN
UPDATE – SEPTEMBER 2019

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# Recycling Marketplace Structural Changes

## Trends

### Changes in the Stream

Some material changing faster than capital investment cycles

\[18\text{M tons in 2000} \Rightarrow \sim 2\text{M tons in 2015}\]

### Material Light-weighting

Skews program economics and current weight-based success metrics

\[\text{Water bottles} \Rightarrow \text{Almost 2x transactions}\]

### China Sword (2018)

China drastically reduces acceptable quality criteria on imported recyclables

\[\text{Plastics} < 0.5\% \Rightarrow \text{Mixed paper banned}\]

### Commodity Markets Crash

Commodity markets have steadily declined due to excess material globally

\[\text{OCC down 75\%} \Rightarrow \text{Mixed paper down 100\%}\]

## Implications

<table>
<thead>
<tr>
<th>Year</th>
<th>Plastic Bottles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>48,000</td>
</tr>
<tr>
<td>2015</td>
<td>92,000</td>
</tr>
</tbody>
</table>

\[48,000 \text{ plastic bottles} = 1 \text{ ton}\]

\[92,000 \text{ plastic bottles} = 1 \text{ ton}\]
Market Uncertainty

Los Angeles Times

Asian countries take a stand against the rich world’s plastic waste

“Amid a growing global movement against non-recyclable plastic, Vietnam and Thailand have said they will block all imported plastic waste in the next few years.”

Malaysia vows to send tons of non-recyclable garbage back to U.S., other developed nations

“Malaysia will not be a dumping ground to the world … we will fight back. Even though we are a small country, we can’t be bullied by developed countries.”

INDEPENDENT

India bans imports of waste plastic to tackle environmental crisis

India has banned imports of waste plastic a year after China, the world’s biggest importer of scrap plastic implemented a similar ban on western imports.

Southeast Asian countries are closing their ports. Materials are being shipped back to originating countries.
Plunging Commodity Prices

76% of the material we sell has declined in value 78-105%.
Glass makes up 7% of our material sold, and has declined 34%.

- Glut of material oversupplies markets
- Oversupplied markets further drive down commodity prices
- Cardboard, mixed paper and aluminum at all-time lows

Source: Wall Street Journal 9/9/19
= % of Republic Services material sold
## Recycling Program Economics Over Time

<table>
<thead>
<tr>
<th>Year</th>
<th>Industry Avg</th>
<th>Net Position</th>
<th>Collection</th>
<th>Processing</th>
<th>Commodity</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990s</td>
<td>$2.00/Mo</td>
<td>($3.00/Mo)</td>
<td>Household cost artificially low to foster adoption</td>
<td>$60/Ton</td>
<td>$200/Ton</td>
<td>$25/Ton</td>
</tr>
<tr>
<td></td>
<td>$0.50/Mo</td>
<td>($1.50/Mo)</td>
<td>Costs lower due to inbound material being cleaner and heavier</td>
<td>$4.60/Mo</td>
<td>($0.10/Mo)</td>
<td>($0.00)</td>
</tr>
<tr>
<td>2018</td>
<td>$3.00/Mo</td>
<td>($4.00/Mo)</td>
<td>Still artificially low but with higher costs to run collection service</td>
<td>$100/Ton</td>
<td>$100/Ton</td>
<td>$50/Ton</td>
</tr>
<tr>
<td></td>
<td>$1.50/Mo</td>
<td>($2.50/Mo)</td>
<td>Dramatically higher costs from labor, technology and equipment, along with lighter material</td>
<td>$1.50/Mo</td>
<td>($0.50/Mo)</td>
<td>($5.50)</td>
</tr>
<tr>
<td>2019</td>
<td>$3.00/Mo</td>
<td>($4.00/Mo)</td>
<td>No change to increased costs</td>
<td>$120/Ton</td>
<td>$70/Ton</td>
<td>$50/Ton</td>
</tr>
<tr>
<td></td>
<td>$0.50/Mo</td>
<td>($3.00/Mo)</td>
<td>Continued cost escalation from labor, technology and equipment</td>
<td>$1.25/Mo</td>
<td>($0.50/Mo)</td>
<td>($6.25)</td>
</tr>
</tbody>
</table>

China Sword exposed a $5.50/month average gap across contracts in 2018. With further market and value declines, that gap is now $6.25/month on average.
Recommended Business Model

**Republic Services**

**COLLECTION**
- Includes costs for truck, driver, container and to collect material and transport to a processing facility
- Comparable to trash collection

**PROCESSING**
- Includes costly facility, equipment and labor to separate material and remove contamination
- Results in ready-to-ship baled material

**RESIDUAL**
- Includes all contaminated or non-recyclable material, which has no marketability and must be transported and disposed at a landfill for additional cost

**Cities & Municipalities**

**COMMODITY SALES**
- Sale of processed material to buyers around the world
- Cleaner material has greater value

The cost of a recycling program is the sum of fees for two services: the **Collection Fee** and the **Net Processing Fee**
Absent a durable recycling model, municipalities are addressing the crisis in multiple ways

**Canceling Program**
- Posen, IL
- Ravalli Co, MT
- Safford, AZ
- Thatcher, AZ
- Cole Co, MO (4 Cities)
- Perryville, MO
- Scott City, MO
- Ascension Parish, LA
- Kennebunkport, ME

**Changing Material List**
- Greensboro, NC
- Arlington Co, VA
- New Orleans, LA
- Lexington, KY (12 Cities)
- Midland, TX
- Hood River Co, OR
- Penn Township, PA
- Jackson, MO
- Wellington, KS
- Morris Co, NJ

**Raising Rates**
- Sacramento, CA
- Riverside, CA
- Milwaukee, WI
- Boston, MA
- Front Royal, VA
- Sanford, ME
- New Britain, CT
- Fort Smith, AR
- Hood River Co, OR

**Dropping Glass**
- New Orleans, LA
- Greensboro, NC
- Winchester, VA
- Penn Township, PA
- Olmos Park, TX

**Burning/Dumping Recyclables**
- Philadelphia, PA
- Surprise, AZ
- Bow, NH

**Changing Service**
- Mecklenburg Co, NC
- Tucson, AZ
- Sarasota, FL
- Revere, MA
- Mitchell, SD
- Jamestown, NY
- Red Wing, MN

Source: NWRA Recycling Program Changes, 8/2/19
Legislation vs. Infrastructure Needs

States addressing challenges through legislation; laws pending or enacted this year include:

- **California** | Bills aim to reduce, reuse, recycle 75% of plastics
- **Washington** | Recycling Development Center created
- **Oregon** | Recycling steering committee formed
- **Maine** | Potential requirements for package manufacturers
- **New Jersey** | Considering ban on plastic bags, straws, foam containers

Infrastructure improvements are needed to make up for loss of China, which took in 40% of world’s recyclables
2019 Media Coverage: A Mixed Bag

Mainstream News Coverage

*American cities confront a "slow-moving recycling crisis"

*Recycling in Chicagoland: We're doing it wrong and soon it'll cost more

Distracting Issues

*VICE NEWS
We're Buying Into a Giant Lie About Plastic

*CLEANING UP THE PLASTIC IN THE OCEAN
Discarded plastic is piling up around the world and polluting the ocean. Sharyn Alfonsi reports on the problem’s deadly consequences for wildlife and what can be done to stop it

We continue to partner with media to help educate the public about the role they play in fixing recycling.
Continued Investments in Education & Outreach

**Media outreach: 2 billion+ unpaid consumer impressions**

Reader's Digest  
TIME  
WGN9  
CBS NEWS  
The Washington Post  
THE WALL STREET JOURNAL  
HUFFPOST  
San Antonio Express-News  
ST. LOUIS POST-DISPATCH

**Consumer education campaign**

Recycling Simplified

Website with tips, videos, printable assets  
Marketing effort in select cities, including billboards, “oops” tags, cart audits  
After 8-week audit in Texas, contamination rate dropped from 21% to 11%

#ICMA2019
Key Topics Going Forward

**Update the business model** to services provided in a recycling program (without reliance on commodity value)

**Evaluate program recyclables** that offer the best benefit to the planet

**Consider better metrics** to track success

**Increase public education**, leading to lower contamination and better commodity values

The public wants to recycle, and is willing to pay for it. The path to creating a durable recycling program requires a multi-faceted approach.
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