Recycling Reimagined
Overcoming Today’s Challenges...

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Evolving Ton

Recycling and organics growing faster than disposal, with most customers demanding recycling.
Trends in Markets

- Glass has negative value in most markets, unless supported by subsidies.
- Corrugated Cardboard has decreased in price per ton for last 5 years.
- End markets impacted by global slow-downs.
Trends in Material

**Trends**

- Material no longer in circulation
  - 18M tons in 2000 → ~2M in 2015

**Implications**

- Lighter-weight and limited end markets
  - HDPE → off-spec PET

- Lighter-weight and flexible packaging
  - Tin can → copolymer pouch

Waste minimization increasing pressure on total waste and recycling tons
Lightweighting of Material

Impact of Lightweighting³

2000

48,000 plastic bottles = 1 ton¹

2015

92,000 plastic bottles = 1 ton¹

Lightweighting requires processing of more material to yield a ton of marketable commodity

For decades, China has been the largest importer of the world’s recycled commodity, and the U.S. was 40% of the inbound stream.

In 2017, China announced efforts to clean up the country, which included dramatic changes for acceptance criteria of imported recyclables.

- A significant reduction in acceptable contamination levels (From ~3% to 0.5%) in any recovered paper and plastic grades.

- Additionally, China banned all mixed paper from import, regardless of contamination levels. (20% of historical stream).

Reductions took effect in March 2018, and drive costs and changes at most recycling facilities in the country to meet new standards.
China closes the door, prices crash

The average price paid to recyclers for a ton of mixed paper in the Pacific Northwest and across North America has plummeted in the last year.

Source: RecyclingMarkets.net
China Sword Immediate Impacts

• Adjusted processing speeds to improve quality of sorted material
  - As a result, some facilities are unable to handle daily material volume
• Adding human resources to our sort lines, and increasing self-inspections to further reduce contamination
• Exploring investments in newer, more accurate sorting technology (in select markets)
• Actively exploring other domestic and international markets
  - Many are flooded by the global industry shifting away from China

While we continue to process mixed paper and old newsprint, we are proactively evaluating the need to dispose of excess material that deteriorates beyond the point of commercial value, or poses safety risks.
Effects on Current Recycling Businesses

Collection Prices do not cover costs
  • Unable to subsidize from commodity sales after China Sword

Light-weighting leads to more items per load
  • We have more material to process per ton

Lack of Public Education and Contamination drives additional costs
  • Cross contamination
  • Disposal costs from residual

Working harder to process more tons, for a negative net revenue
New Recycling Business Model

The Cost of Recycling

Collection
- Cost to provide truck, driver, container and scheduled collection service on contracted basis
- Collected material transported to processing facility

Processing
- Capital & labor intensive process
- Comingled material sorted into separate products, removing contamination
- Clean products baled and prepared to ship

Residual
- Contaminated or non-recyclable material
- No marketability
- Must be transported and disposed at landfill for a cost

Commodity Sales
- Processed material transported and sold to end markets
- Subject to quality standards
- Product mix and quality drives value
- Some material may have negative value

Monthly Collection Charge + Net Processing Fee (Commodity sales – processing costs – residual cost)

The cost of a recycling collection program is the sum of the Collection Charge and the Net Processing Fee
1. **Public Education – WHAT to Recycle**

<table>
<thead>
<tr>
<th>ALWAYS Recyclable</th>
<th>NEVER Recyclable</th>
<th>SOMETIMES Recyclable (Select Markets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>Diapers</td>
<td>Plastic Bags</td>
</tr>
<tr>
<td>Plastic</td>
<td>Garden Hoses</td>
<td>Glass</td>
</tr>
<tr>
<td>Metal</td>
<td>Shoes/Clothing</td>
<td></td>
</tr>
<tr>
<td>Cardboard</td>
<td>Food Waste</td>
<td></td>
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<tr>
<td></td>
<td>Yard Waste</td>
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</tbody>
</table>

**ALWAYS Recyclable**

**NEVER Recyclable**

**SOMETIMES Recyclable (Select Markets)**

2. **Public Education – HOW to Recycle**

- **Empty.** Remove any remaining food or liquid contents from your recyclable item before placing it in a recycling container;

- **Clean.** Lightly rinse the recyclable item to remove any remaining residue; and

- **Dry.** Gently shake out excess water or let the recyclable item air dry before placing it in a recycling container.
Long Term - Reassessment of Accepted Materials

• Programs have drifted to focus on total diversion rates, rather than what materials are truly beneficial to recycle

• Some collected materials are recyclable, but lack local end markets, or have a negative recycling value. These realities render the processed materials unmarketable

• Municipalities need to shift program focus to Sustainable Materials Management-based views, which looks at the overall benefits of each accepted material in the stream.

Recycling programs must focus on Sustainable Materials Management, not simply diverting material that may have no beneficial use
Next Steps: how we keep recycling sustainable for both businesses and communities

1. Price Increase needed to address shortfall due to collection costs no longer covered by commodity revenues
2. Implement Public Education programs to inform customers what to recycle and how to recycle – clean up the contamination in the stream
3. Move to the new recycling business model – either at the next contract cycle, or via amendment to current contract

The decades old recycling model is no longer executable or viable. Immediate partnering is needed, as well as a new business model.
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