Recycling Markets and CRT Glass

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Sims Recycling Solutions
July 17, 2014
Sims Metal Management: 250+ Locations

- EU: 49 operations
- Asia: 5 Representative offices
- Singapore: 1 Operation
- NZ: 10 Operations
- Australia: 53 Operations
- South Africa: 1 Operation
- India: 3 Operations
- Florida: 2 Operations
- Alabama/Tennessee/Mississippi: 16 Operations
- Arkansas/Texas/Louisiana: 9 Operations
- Arizona/Colorado/Utah/Nevada: 9 Operations
- California: 40 Operations
- British Columbia: 5 Operations
- Ohio/Indiana/Illinois: 21 Operations
- Ontario/Michigan: 2 Sites
- New York/New Jersey/Connecticut: 19 Operations
- Pennsylvania/Virginia/South Carolina/Kentucky: 9 Operations
- Arizona/Colorado/Utah/Nevada: 9 Operations
- Alberta: 5 Operations
- Sims Metal Management: 250+ Locations
The world’s largest electronics recovery and recycling company
Over 2000 employees, ~600 in US
2013 FY production = ~500,000 tons of electronics recycled, >100,000 tons (200 million pounds) in US
Many facilities “multi-service”
Circa 2 million individual assets recovered for reuse / year
Over 15m individual Integrated Circuits recovered
Exposure to many differing legislative models
Typical Sims Recycling Facility

- Shipping and Receiving
- Decontamination
- Manual disassembly
- Material reduction processes (e.g. shredders)
- Material separation processes (e.g. magnets, eddy currents, air tables)
High Volume Output Commodities

- Ferrous
- Circuit Board
- Non-Ferrous
- Plastic
Low value (negative value) material
Sources of Material

- **Factory scrap**
  - Volume fluctuates as manufacturing relocates
  - Most manufacturers require assured destruction

- **Excess / obsolete inventory**
  - Some asset management opportunities
  - Often inventory is very low value

- **B2B**
  - Assured destruction
  - Asset management
  - Revenue share

- **C2B**
  - Very low value / high costs
  - State compliance material
Consumer Material Received

- Non- CEDs
- Non-Display CEDs
- Non-CRT Displays
- CRTs

Graph showing the percentage of material received from 2010 to 2013.
Consumer Material Received

Television = ~ 75%

- Non-CEDs
- Non-Display CEDs
- Non-CRT Displays
- CRTs
Economics of Electronics Recycling

• Very simple math:

\[
\text{Cost of acquisition + separation and preparation of commodity materials} + \text{value of commodity materials} = \text{profit or loss}
\]

• Collection and transportation (acquisition) are often the biggest expenses – the marketplace determines these costs

• Processes can be manual or automated

• High quality processes that protect workers and the environment require high $$ investment

• Commodity values play important role (gold, steel, plastics) and are most volatile of all factors – the marketplace determines value
## Cost Estimate (per pound)

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>PC</th>
<th>CRT Monitor</th>
<th>CRT Television</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection</td>
<td>-.04</td>
<td>-.04</td>
<td>-.04</td>
</tr>
<tr>
<td>Transportation</td>
<td>-.05</td>
<td>-.05</td>
<td>-.05</td>
</tr>
<tr>
<td>Commodity generation</td>
<td>-.13</td>
<td>-.09</td>
<td>-.09</td>
</tr>
<tr>
<td>Commodity value</td>
<td>+.42</td>
<td>-.06</td>
<td>-.08</td>
</tr>
<tr>
<td>Avg weight (lbs.)</td>
<td>22</td>
<td>31</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>$4.35 profit</td>
<td>$7.44 loss</td>
<td>$18.20 loss</td>
</tr>
</tbody>
</table>
Consumer Material Received

Television = ~ 75%

Non-CEDs
Non-Display CEDs
Non-CRT Displays
CRTs
What CRT Piles Really Look Like
Glass Transformation

- Hand breaking
- "Automated" cutting
- Shredding

- Coating removal
- Sorting
- Polishing
Recycling/Disposal Options for CRT Glass

- **Glass to Glass**
  - One manufacturing plant left in world; located in India; long term prospects are limited

- **Lead Smelters**
  - Requires long distance transportation; limited capacity

- **Glass Furnaces**
  - Unproven technology; requires large investment

- **Landfill**
  - May defeat the purpose of producer responsibility law

- **Alternate Daily Cover**
  - Most states reject as appropriate for their covered products

- **Application to Roadbed**
  - Not approved in US

- **Manufacture of Other Products**
  - Requires extensive material prep; often requires export
Help (and hindrance) in Handling of CRT Glass

• CRT Rule vs. RCRA
  – Exception from hazardous waste rule under certain conditions
  – Makes it easier to manage
  – Needs updating

• Conditional exclusion from RCRA:

  §261.39

(c) Processed CRT glass sent to CRT glass making or lead smelting: Glass from used CRTs that is destined for recycling at a CRT glass manufacturer or a lead smelter after processing is not a solid waste unless it is speculatively accumulated as defined in §261.1(c)(8).
Handling of CRT Glass

The impact at the state level:

California Universal Waste regulations:

"CRT glass" means any glass released or derived from the treatment or breakage of one or more CRTs or CRT electronic devices that contain CRTs and subsequently reclaimed at a CRT glass manufacturer, or a primary or secondary lead smelter.

Consequence: Can not get paid by the state for the recycling if not sent to lead smelter or CRT glass manufacturer.
How Much Glass is There?

• 7.2 million tons awaiting eventual disposal – 85% thought to be discarded in next 10 years
• >12 billion pounds in the next decade!?!?!?!?

• Piles of glass are everywhere:
  – August 2012 – 1.2 million pounds in mid-Atlantic
  – September 2013 – 8 million pounds in Arizona
  – February 2014 – 1 million pounds in New Jersey
  – March 2014 – 6 million pounds in Cincinnati

• What is industry capacity?
• What can be done with it?
• What is the cost?
• Who will pay?