LCD THE NEW CRT?

The Next Challenge in Electronics Recycling
Although I have only worked in the recycling industry for about 8 years, I have grown up around the business as my family has owned Manitoba Corporation since its establishment in 1916. Prior to entering the recycling industry, I was in software sales for Adaco Services. I graduated from college with a Bachelor’s degree from Niagara University in 2003. I am also actively involved with the Canadian Association of Recycling Industries (CARI) and Camp Good Days and Special Times.

ADAM SHINE

VP of Sunnking, Manitoba, and Utility Services of America
Board member on Institute of Scrap Recycling Industries (ISRI)
Leadership Buffalo Rising Leaders program: 2008
University at Buffalo School of Management Center for Entrepreneurial Leadership: 2012

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We are focused on reducing the amount of e-waste that ends up in landfills and promote the responsible reuse, repair, and recycling of unwanted electronic equipment.

R2/RIOS certified recycler
Operates in Brockport, Buffalo, and Syracuse
Formed in 2000
Largest electronics recycler in NYS
ECONOMICS OF ELECTRONICS RECYCLING

VALUE OF COMMODITIES - ACQUISITION - SEPARATION - PREPARATION = PROFIT OR LOSS
CATHODE RAY TUBE DEVICES
CATHODE RAY TUBE

Basic components

Leaded glass was originally used in CRT devices because it improved the optical quality of the glass and acted as a shield against radiation generation by the electron gun and electron beam. One device contains between 2 and 8 lbs of lead.
DECLINE OF THE CRT

PRIOR TO 2009
CRT glass was used for new CRT manufacturing (“glass-to-glass”)

2009 – 2014
“Glass-to-glass” market dwindling as LCDs gain popularity

BY 2014
The market for CRT glass vanished as LCDs entirely replace CRTS
“Recycling markets for CRT glass are limited, costly, and far away making CRT glass recycling a challenge to e-scrap recyclers. As a result, some e-scrap recyclers have been left with large quantities of stored CRT glass for which they are hard-pressed to find cost effective, large quantity markets.”

-Florida Department of Environmental Protection
There have been numerous cases of recyclers stockpiling CRTs then going out of business and abandoning warehouses full of CRTs.
EMERGING DOWNSTREAM MARKETS

New downstream markets are emerging for CRT glass.

- TREATING GLASS AND PLACING IN A DEDICATED CELL IN LANDFILL
- USING AS A FLUX IN COPPER AND LEAD SMELTING
- SEPARATING LEAD AND GLASS THROUGH SMELTING
- PRODUCING CERAMICS FROM PROCESSED GLASS
RESOLVING THE ISSUE

CURRENT
Recognition that recycling is not free, determine the actual costs to responsibly recycle.

FUTURE
End producer take-back and other artificial influences if the market can sustain itself.
COLD CATHODE FLORESCENT LAMP DEVICES
2001 – 2014

470 million CCFL devices were sold in the U.S. With an average lifespan of 3-10 years, they have already begun to enter the waste stream.
Currently, there are still downstream markets for whole and parts of LCDs. However, there are times when reuse is not an option. In this case, recycling for commodities is necessary. There is a negative cost associated with recycling them in this way.
CCFL LCD

Basic components

CCFL LCDs are composed of layers of polarizers, filters, and a layer of thin fluorescent tubes that contain mercury.

Cold Cathode Florescent Lamps

1-10 MGS Mercury
(number of lamps varies based on the size of the device)
PROCESSING LCDS

MANUAL

PROCESS
1. Dismantle casings, external frames, support, & external cables
2. Progressive dismantling of the displays & extraction of valuable parts PCBs, Ferrous/non-ferrous parts, PMMA board and plastic foils, & internal cables
3. Dismantling of potentially hazardous parts fluorescent lamps, LCD, & Capacitors
4. Dismantle of residual parts speakers and fans, fasteners, minor plastic parts, & minor metal parts

ADVANTAGES
Less potential exposure to mercury
Ease of entry is low due to similarity to dismantling CRTs
No permits required

DISADVANTAGES
Highly labor intensive

CURRENTLY ONLY OPTION AVAILABLE

AUTOMATED

PROCESS
1. Product progressively shredded and reduced to small parts
2. Removal of hazardous substances
3. Use of mechanical systems (based on magnets, eddy current, or density/optical separators) to sort different fractions ferrous metals, non-ferrous metals, & plastics

ADVANTAGES
Faster

DISADVANTAGES
Large capital investment
Limited systems available
Cannot fully remove all mercury vapor, putting employees at risk
RESOLVING THE ISSUE

CURRENT
Charge to cover the cost of recycling.

FUTURE
Make improvements to automated technology so that it fully removes mercury.
FUTURE OF ELECTRONICS RECYCLING

MANUFACTURERS MUST CONSIDER END-OF-LIFE IN DESIGN OF PRODUCTS
THANK YOU

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