Electronics Recycling in CO: 15 years of work!

Anne Peters
Gracestone, Inc.

Themes
1. Information on hazardous materials in electronics – and impacts
2. Pervasiveness of electronics
3. Regulation
4. Global metals markets trigger growth of e-cycling
5. Better ways to extract value from complex engineered products
6. Grassroots efforts around e-waste problems
7. Market-driven solutions (certification, EPEAT)
8. Outreach & education


- Larry Huckaby, Agilent
- Jay Freedberg, Atlas Metal
- Pat McKern, CDPHE
- Jay Johnson, Comp USA
- Eric Lombardi, Eco-Cycle
- Whitney Truelove-Cranor EPA
- John Hughes, Hewlett-Packard
- Linda Case, Larimer County
- Wade Luther, NATEX
- Chris Hoofnagel, Pitkin County Resource Recovery
- Roger Neuschler, Silver Anvil
- Kevin McCarthy, Waste Management Recycle America
- Anita Comer, Waste Not Recycling
- Steve Kelton, Western Disposal
- Susan Castellon, OEMC staff
2001

- CO legislation CRS 25-17-105.5
- Created pilot project to increase recycling of CRTs in the state
  - and, by default, all scrap electronics
- No funds allocated but deal worked out to get grant money from CCHE to CDPHE to carry out project
- December – CDPHE designates electronics as Universal Waste, issues Compliance Bulletin

2002: Europe

European Union Directive 2002/95/EC 1/27/03

- Waste electrical and electronic waste (WEEE). By 2005 authorities must:
  - Legislate free take back of waste goods
  - Ensure that OEMs finance the collection, treatment, recovery and disposal of all waste.
- Restriction on hazardous substances (RoHS) in manufactured equipment law:
  - OEMs must cease using Pb, Hg, cadmium, and hex-chromium, or the brominated flame retardants PBDE and PBB, in products after 7/1/06.

2002-2005

CO CRT Recycling Pilot Project

CDPHE

- 2 years of education & research
- Identified size of problem & opportunity
- Extensive outreach to all business groups
- Comprehensive website
- Advisory group
- Final report
- Robust infrastructure resulted
  - Many businesses
  - Little gov’t funds spent then
  - Increased access to e-cycling

Estimated Number of CRTs in Colorado
Fate of Obsolete CRTs in Colorado (Preliminary Results)

Potential Toxics in Landfill from CRTs (Preliminary Results)

2002: Overseas issues

- Much media coverage in early 2002.
- Documentation of shocking “recycling” practices in Asia.

Is it waste or not?
Unwanted electronics equipment owned by a business.

- Working or non-working?
  - If working…
    - Put in trash: Regulated as hazardous waste. ILLEGAL
    - Donate for reuse: Not regulated as hazardous waste.
    - Pay for or be paid by recycler or broker to take equipment to resell or refurbish: Not regulated as hazardous waste.

- If not working…
  - Send for diagnosis and repair: Not regulated as hazardous waste.
  - Donate to nonprofit for refurbishing: Not regulated as hazardous waste.

Pieces and parts from refurbishing or repair are put in trash: Regulated as hazardous waste. ILLEGAL.

Source: Basel Action Network 2001
More photos from Guiyi Province, China

Source: Basel Action Network 2001

2003 or so...
Collection Events, AND...

- Dell Collection Event in Denver
- CAFR & CO Office Energy Management – Computer Collection Event training
- June – CDPHE updates *Compliance Bulletin* on Electronic Wastes

Dell’s FREE tour comes to Denver, Memorial Day ‘03

Source: Basel Action Network 2001

Update 3/24/03
Washington Post finds continued open burning practices in Guiyu

Source: Basel Action Network 2001
Denver collected 275 Tons of e-scrap in one day

2003: Elsewhere in the country - trends

- WEPSI studies
- NEPSI negotiations & final results
- Market in flux while infrastructure develops & stakeholders position
- Manufacturers shifting roles - Dell takeback campaign
- Voluntary education by jurisdictions & manufacturers
2003: California Passes First E-waste ARF Law

- Reimbursement from state fund to electronics recycler
- Recycler reimburses jurisdiction that sponsors e-waste collection
- But counties can get block grants reimbursement too

2004: Colorado

- CDPHE offers Interpretive Guidance for electronics recyclers

2004

- Grassroots groups increase activism for producer takeback
- Info on human health impacts grows

2005

- Many CO jurisdictions
  - Host collection events
  - Address their own e-waste issues & begin hiring electronics recyclers
  - Add electronics to local waste/recycle planning work
  - Consider banning e-waste at their landfills
Mid-2000s: States Study E-waste

• Many states have conducted studies & reported to their legislatures
  – WA, ME, GA, CO, OR, CA. etc.
• Assess opportunities
• Size of problem
• Learning: important not to pass legislation without supporting the development of e-cycle infrastructure

March of Legislation

• 2003: California
• 2004: Maine
• 2005: Maryland
• 2006: Washington
• 2007: Connecticut, Minnesota, Oregon, Texas, North Carolina
• 2009: Indiana, Wisconsin
• 2010: Vermont, South Carolina, New York, Pennsylvania
• 2011: Utah
• 2012: Colorado

2003 – 2012: Product Stewardship Laws Enacted

2005 ~ 2008
Market-based Certifications & Purchasing Tools

• 2007: EPEAT – Electronic Product Environmental Assessment Tool
• Need for certifiable standards for electronics recyclers
  – BAN’s Pledge (2008), then e-Stewards (2010)
  – EPA’s R2 (2008)
  – Both get updated this year
~ 2007: Good learnings statewide

- Summit County collections:
  - 1st collection event 2001; Then Saturday-only drop-off pilot in 2002
  - Got too much e-waste left in other areas
  - Realized: Mixed Message: electronics are NOT just like any other recyclable; similar to HHW
  - Shifted back to collection events, with drop-off locations
- Garfield County: Landfill ban
- Fort Collins: Curbside ban
- Boulder: CHaRM

2006 – 2009: Electronics Still Found in CO Landfills

<table>
<thead>
<tr>
<th>Waste Study</th>
<th>Date</th>
<th>Percent Electronics Found</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagle/Garfield/Pitkin Counties</td>
<td>2009</td>
<td>0.5% Residential 0.1% Commercial</td>
<td>Data from 4 landfills One season audit</td>
</tr>
<tr>
<td>Denver City &amp; County</td>
<td>2008</td>
<td>0.6% Residential</td>
<td>Two season study</td>
</tr>
<tr>
<td>Larimer County</td>
<td>2007</td>
<td>2.2% Residential 0.6% Commercial 2.4% Self-haul</td>
<td>Four season study</td>
</tr>
<tr>
<td>Chaffee/Lake Counties</td>
<td>2006</td>
<td>1.2% Residential + Commercial</td>
<td>One season audit</td>
</tr>
</tbody>
</table>

Source: Gracestone, Inc. 2010 literature review

2008: 60 Minutes Expose of Colorado’s Executive Recycling

2009: Colorado Electronic Device Recycling Task Force

- Legislatively mandated task force to study e-waste issues in the state
- Group deliberated recommendations for best course for CAFR
- Landfill ban was one thing we all agreed on
2011: National Level

- Federal Interagency Task Force on Electronics Stewardship
  - White House Council on Environmental Quality, EPA, & GSA
- Issue “National Strategy for Electronics Stewardship”, recommending:
  - Better Federal management of its own e-scrap
  - Incent design-for-environment
  - Reduce harm from exports

2012: Colorado Passes SB-133

- Bans landfill disposal of many electronics
- Requires state to use certified electronics recyclers for its own e-waste
- Educational requirements

2012: United States

- Percentage of Population Covered by E-Waste Law
  - 33.9% Covered
  - 66.1% Not Covered

2013: Where are we now?

- Executive Recycling’s been convicted
  - Sentencing in April
- 90% citizens think old electronics should be recycled
- Challenges of implementing SB133
- Questions of political will to get product stewardship law in CO
- Number & type of e-cyclers continues to grow
- Many e-cyclers working on certification
For more information:

Anne Peters  
Gracestone, Inc.  
Boulder, CO  

303.494.4934 voice  
303.494.4880 fax  
annep@indra.com  
www.gracestoneinc.com