

OSC 10
Ohio Safety Congress & Expo

Electronic waste – issues with proper management and recycling

465

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Thursday, April 1, 2010 2:15 to 3:15 p.m.

E-WASTE ISSUES



OhioEPA

Electronic Waste – Issues with Proper Management and Recycling

Overview of E-Waste 

 Residential E-Waste

Business E-Waste 

Why Recycle Electronics?



Overwhelming Quantity

220.9 million units ready for End-of-Life (EOL) management in 2006 (2.1 million tons)

- ❑ Desktops: 28.3 million
- ❑ Portables: 10.2 million
- ❑ Mice/keyboards: 96.8 million
- ❑ Monitors: 35.9 million
- ❑ Televisions: 25.7 million

Estimated Annual Personal Computer Products Ready for EOL Management, By Year and Estimated Annual Television and Cell Phone Products Ready for EOL Management, "Electronics Waste Management in the United States: Approach 1," April 2007

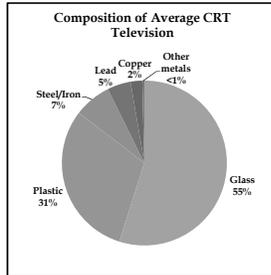
Filling up the landfills

- ❑ Approximately 18 percent, by weight, is collected for recycling
- ❑ Basically 1.7 million tons of e-waste disposed of in 2006 (landfill or incineration)



Distribution of EOL Products By Management Method, "Electronics Waste Management in the United States: Approach 1," April 2007

What are electronics made of?



- ▣ 63.4 lbs in average Cathode Ray Tube TV
- ▣ 34.7 lbs glass
- ▣ 19.3 lbs plastic
- ▣ 9.4 lbs metals

Product Mass Estimates presented in US EPA, "Management of Electronic Waste in the United States: Approach Two," April 2007; Industrial Economics, Inc., based on average mass of a CRT TVs during the 1990-2005 period.

Hazardous Components

- ▣ Lead
- ▣ Cadmium
- ▣ Mercury
- ▣ Brominated Flame Retardants



Concerns about exporting



A sea of television housings, cathode ray tubes, computers, monitors and other imported electronic waste not salable at the Alaba market in Lagos, Nigeria, is dumped here in a nearby swamp. (Image: 4969) © Basel Action Network

Concerns about exporting



Migrant child from Hunan province sits atop one of countless piles of unrecyclable computer waste imported from around the world. Guiyu, China. December 2001. © Basel Action Network

Concerns about exporting



Migrant workers in Guiyu, China, scavenge used electronic equipment, which often contains highly toxic material. Photograph: Jim Puckett/AP
Source: guardian.co.uk, Monday 22 February 2010
www.guardian.co.uk/environment/2010/feb/22/electronic-waste

Federal Actions

- ▣ CRT Rule
 - Effective January, 2007
 - Requires exporters of CRTs to notify US EPA of plans to export used and broken CRTs for recycling
 - US EPA will then notify receiving country

Federal Actions

- GAO Report in August 2008 found significant weaknesses in U.S. EPA regulations and enforcement regarding exportation of e-waste



60 Minutes Following the Trail of Toxic E-Waste



60 Minutes Following the Trail of Toxic E-Waste



Certification Programs

- Responsible Recycling (R2) Practices
 - US EPA: Set of guidelines for accredited certification programs to assess electronics recyclers environmental, worker health and safety, and security practices. (Oct. 2008)
- E-Stewards
 - Basel Action Network Certification Program
 - Standards issued March, 2010
 - Ohio companies certified: Redemtech and 2trg

Ohio EPA involvement

- Division of Solid and Infectious Waste Management
 - Recycling is our focus....



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Solid Waste Management Districts



TV collections in Ohio



Television Collections

2007

- ▣ 22 Solid Waste Districts collected over 1 million pounds of televisions (approximately 17,000 units)
- ▣ Just over \$200,000 was spent collectively

2008

- ▣ 20 Districts reported: 915,000 pounds of televisions collected (over 13,000 units)
- ▣ 31 Districts held collections
- ▣ Projection: 1,400,000 million lbs and 20,000 units?

Legislation



- ▣ 20 states in the US currently have laws establishing statewide electronics recycling programs
- ▣ In Ohio, HB 447 has just been introduced
 - Requires recycler registration
 - Requires manufacturers to arrange for recycling

Now, what about businesses....?



Managing e-waste from your business

- ▣ Most electronic waste is considered a hazardous waste when disposed
 - University of Florida study
- ▣ Hazardous waste cannot go in the trash
 - If you **properly** recycle the electronic waste, then it is exempt from Ohio EPA's hazardous waste rules



Two ways to void the recycling exemption

- ▣ Speculative Accumulation
 - must have a recycler set up to take e-waste
 - must have sent 75% of e-waste off-site within a year
 - must be managed as a recyclable material (in other words, they aren't being stored outside in a big pile)
- ▣ Use constituting disposal
 - Example: recycler is grinding up glass from monitors for use in road aggregate

Managing e-waste from your business

- ☐ If you chuck your e-waste, you must have documentation on site to demonstrate your e-waste is non-hazardous



Hazardous Components In Computers

- ☐ PC:
 - Circuit board – lead solder
- ☐ Keyboard – lead solder & cadmium
- ☐ Computer Monitor:
 - Glass - lead
 - CRT – lead
 - Seal between screen and back of monitor – lead



Hazardous Components In Computers

Name	Content (% of Tot Wt)	Weight (lb.)	Use/Location
Arsenic	0.0013	< 0.1	Agents in transistors/PWB
Barium	0.0315	< 0.1	Vacuum tube/CRT
Beryllium	0.0157	< 0.1	Thermal conductivity
Cadmium	0.0094	< 0.1	Battery, PWB, CRT
Chromium	0.0063	< 0.1	Steel housing
Lead	6.2988	3.8	Solder, frit, CRT
Mercury	0.0022	< 0.1	Battery, switches

Microelectronics & Comp. Corp. (MCC) 1996 – Elec. Ind. Env. Road. Austin, TX

Resources

US EPA websites –

- ☐ Responsible Recycling (R2) Practices
www.epa.gov/osw/conservation/materials/ recycling/r2practices.htm
- ☐ Companies approved to export CRTs
www.epa.gov/osw/hazard/international/crts/recycling.htm
- ☐ Plug-In to eCycling
www.epa.gov/epawaste/partnerships/plugin/index.htm

Resources

Ohio EPA websites -

- ☐ OCAPP: Guide to Electronics Recycling
epa.ohio.gov/ocapp/p2/recyc/comprc.aspx
- ☐ OCAPP: Electronic Waste Management
epa.ohio.gov/ocapp/p2/mercury_pbt/ewaste/index.aspx
- ☐ OCAPP: List of Recyclers
epa.ohio.gov/ocapp/Recycle.aspx

Resources

Other websites -

- ☐ EPEAT: Green Electronics Made Easy
www.epeat.net
- ☐ Earth 911
earth911.com
- ☐ E-stewards program
www.e-stewards.org/index.html
- ☐ Checklist for selecting recyclers
www.federalelectronicchallenge.net/resources/docs/select.pdf

Disposal and Recycling Options

Contact Office of Compliance Assistance
and Pollution Prevention (OCAPP)

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QUESTIONS?

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