National Center for Electronics Recycling:

• Non-profit 501c3, est. 2005, in Vienna, WV
• Involved in Federal, State & Association Projects
• Conduct Research, Run Collection Programs
• Partner with NERC on Electronics Recycling Coordination Clearinghouse (ERCC)
• Manage Oregon State Contractor Program, Vermont State Standard Plan, administer ERRO Illinois Manufacturer Clearinghouse
• Our Mission: Dedicated to the development and enhancement of a national infrastructure for the recycling of used electronics in the U.S.
State Law Overview and Major Challenges

• State Laws – How did we get here?
• Challenges – then and now
  • CRTs, other materials and proper management
  • Lighter products
• Outlook for future
States with E-Scrap Laws

States highlighted in orange have some type of electronics recycling program law.
25 State Program Laws + DC

- **2003**: California
- **2004**: Maine
- **2005**: Maryland
- **2006**: Washington
- **2007**: Connecticut, Minnesota, Oregon, Texas, North Carolina

Percentage of Population Covered by E-Scrap Law

- 66.1%
- 33.9%

**2008***: New Jersey, Oklahoma, Virginia, W. Virginia, Missouri, Hawaii, Rhode Island, Illinois, Michigan
- **2009**: Indiana, Wisconsin
- **2010**: Vermont, South Carolina, New York, Pennsylvania
- **2011**: Utah
- **2014**: DC
- **2015-2018** - none

Number of New Laws

- **2003**: 2
- **2005**: 2
- **2007**: 8
- **2009**: 1

**Number of New Laws**

- 0
- 2
- 4
- 6
- 8
- 10
Manufacturers must develop and implement their own recycling programs for their own returned products. MI has voluntary market weight-based goal.

**Returns + TV Market Share** - IT manufacturers pay for costs of their own branded products collected plus a pro rata share of orphan products. TV manufacturers pay based on their market share percentage of all TVs returned.

**Types of Financing**

**ARF** - Electronic Waste Recycling Fee, assessed on the sale of covered electronic products.

**FEE** - Manufacturer Annual Registration Fees (can be significantly reduced by establishing an approved take-back program).

**SHARE** - Manufacturers must finance a program to collect & recycle a share of covered products, either collectively or independently. All but OR use market share only.

**LBS. SOLD**

Manufacturer pays registration fee and for collection and recycling of covered electronic devices based on their yearly sales to households.

**LBS. SOLD SHARE**

Manufacturers are assigned a market share percentage based on total weight sold into the state. A separate per capita goal is used for collection targets. (IL uses return share for IT devices).
Some states cover a wide variety of electronic products under their law. Others are more narrow and may only include laptop computers and monitors. Go to ecycleclearinghouse.org for more details.
CRTs – Still Challenging, but Declining

- Old “tube-style” TVs and monitors
- Still dominant weight under state programs - 50-70%, down from 60-80%
  - Most states focus on consumer collection rather than business
- Difficult to collect, transport, due to weight (largest over 200 lbs)
- Contain lead in back (funnel) glass, lead in “frit” solder sealing front and back glass
  - Hazardous/universal waste management implications
- Some low-grade circuit boards, copper, steel band, plastic, BUT does not offset cost of transporting, managing glass
- Households still able to dispose in landfills in over half of states
What Happens with CRTs?

• CRTs collected by numerous types of entities as “collectors”, Then to a “recycler” after collector BUT...

• Some “recyclers” merely sort, wrap for further transport

• Others remove the tube, sell materials other than glass, send whole tubes further downstream

• Limited number process, separate and clean CRT glass
  • Panel and funnel separation, “washing”/cleaning
  • End with “processed glass”, “furnace-ready cullet”

• Changing ultimate end destinations after that can be:
  • Smelters
  • Ceramics
  • “retrievable storage”
  • landfill
What Shouldn’t Happen with CRTs

• Stockpiling, then abandonment

• Why? #1 Cost: Recycler bring in CRTs, not enough to pay for proper downstream
  • Mismatch between collector’s recycler and manufacturer’s recycler

• Changing markets

• Restrictions from certification programs, state laws, customer contracts limit options

• Time limits on accumulation

• Can lead to abandonment or dumping – at least 10-15 instances, with waste management implications

• Fewer CRTs being returned, should lead to fewer or smaller abandonment cases
Overall Trend
Cumulative Per Capita Rates Change

No State over 7 lbs per capita as of 2017

2015

2016: -6%

2017: -10%
Total Estimates Pounds Sold of Common Covered Household Electronics

- 2014: 2,437,179,386
- 2015: 2,157,813,244
- 2016: 1,535,710,334
- 2017: 1,461,172,587
Forecast Collection

Total collection volume and weight

- Weight of devices collected decreases
- Number of devices collected increases

2020:
- Flat Screen TV
- CRT TV

2015:
- Flat Screen TV
- CRT TV

Smartphones:
- Total collection volume and weight
  - Millions of lbs

Tablets:
- Total collection volume and weight
  - Millions of units

Other devices:
- Laptops
- Desktops
- Flat screen monitors
- CRT monitors
- Printers
Pounds Down, but New Concerns

• How do we measure success and fairly divide costs (for EPR programs) with declining weights?
  • Difficult to count units in recycling process, what else?

• Other challenging product/material streams
  • Mercury LCDs (now all LED)
  • Lithium-ion, other batteries
  • Plastics – changing markets, BFR plastics, landfill?

• Changing product scope – what should be covered?
  • Electronics, sensors, circuit boards being integrated into many other products, items

• Some industry discussions on new potential funding model, such as eco-fees, but no proposals yet
Interest in Illinois Developments

• Many states, manufacturers, recyclers, struggling with how to adapt programs to declining weight with targets
  • IL offers one approach, others watching how it progresses
    • No lbs goals, but manufacturers must cover all counties who “opt-in”
    • Manufacturers involved in Clearinghouse Rules, working through group plans for implementation
  
• All covered manufacturers working through Clearinghouse for 2019 and 2020

• Other options – “eco-fee” on new devices, covers costs of returns
  • Tie goals to previous collection year
Outlook

- Declining pounds present new challenges – targets, funding levels, etc.
- Still waste/material management challenges, moving away from bulky CRT/lead issues
- States still looking to modify due to challenges
- Still no new state laws (*DC) since 2011, will we ever have #26?
- Which electronics need to be covered/funded by laws? What criteria will we use in the post-CRT future?
- Possible federal approach - industry discussion stage
Thank You!

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Backup Slides
What the Clearinghouse Does/Doesn’t Do

• **DOES** help manufacturers collectively meet the requirements to implement a statewide “manufacturer e-waste program” in Illinois through a joint Plan

• **DOES** administer manufacturer obligation percentages within the Program Plan, request existing relationship preferences, and then allocate opt-in counties to individual manufacturers or groups

• **DOES** set rules for manufacturer or designated group participation

• **DOES** establish an auditing program for verifying reported pound totals and collector practices

• **DOES** compile information required and submit Program Plan to IEPA
Eastern States - Pounds Per Capita by State 2015-2017

Connecticut: 2015 (4.06), 2016 (4.18), 2017 (3.77)
New Jersey: 2015 (5.17), 2016 (6.19), 2017 (5.11)
New York: 2015 (5.11), 2016 (5.89), 2017 (5.35)
Pennsylvania: 2015 (4.87), 2016 (4.9), 2017 (4.54)
Rhode Island: 2015 (5.92), 2016 (5.61), 2017 (6.24)
Vermont: 2015 (7.82), 2016 (7.59), 2017 (6.91)