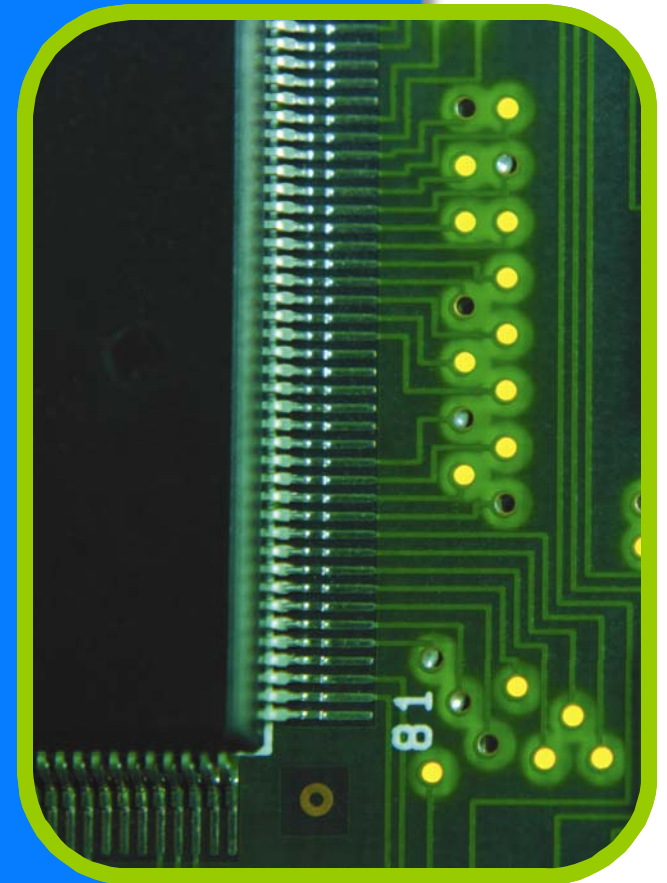


# Recycling Electronics: Summary of Federal Efforts

Kim Bartels  
EPA Region 8  
Pollution Prevention Program  
July 2009



# Management of Used and End-of-Life Electronics

- Consumer electronics comprise about 1.2% of the MSW stream
- A 220% increase in the number of electronics discarded from 1997-2007 was found.
- The 2007 national recycling rate:
  - 18% of TVs and computers
  - 10% of cell phones



Statistics webpage: [www.epa.gov/waste/conservation/materials/recycling/manage.htm](http://www.epa.gov/waste/conservation/materials/recycling/manage.htm)



# Management of Used and End-of-Life Electronics

<b>2007 End-Of-Life Management</b>				
	<b>Generated (million of units)</b>	<b>Disposed (million of units)</b>	<b>Recycled (million of units)</b>	<b>Recycling Rate (by weight)</b>
<b>Televisions</b>	26.9	20.6	6.3	18%
<b>Computer Products*</b>	205.5	157.3	48.2	18%
<b>Cell Phones</b>	140.3	126.3	14.0	10%

\*Computer products include CPUs, monitors, notebooks, keyboards, mice, and hard copy peripherals.

Statistics webpage: [www.epa.gov/waste/conserva/materials/ecycling/manage.htm](http://www.epa.gov/waste/conserva/materials/ecycling/manage.htm)



# Environmental Benefits of Reuse & Recycling

- **Reuse:** extends the life of the product; increasing use from the energy & material inputs
- **Recycling:** recovers materials – metals, glass, plastics – reducing the extraction and processing of virgin resources



# Environmental Benefits of Recycling

In 2007, the US recycled **414,000 tons** of electronics resulting in...

## Greenhouse Gas (GHG) Reductions:

974,000 MTCO<sub>2</sub>E, equivalent to the annual emissions from more than **178,000** passenger vehicles.

## Energy Savings:

18 trillion BTUs, equivalent to the energy content of **140 million gallons** of gasoline.



# EPA's Interest in End-of-Life Electronics

## Four concerns:

- Rapid growth in the use & obsolescence
- Opportunity to recover large amounts of embodied energy and valuable materials inherent in used electronics
- Presence of toxic substances
- Ensure that recycling is done in an environmentally safe manner



# Increasing Safe Reuse and Recycling

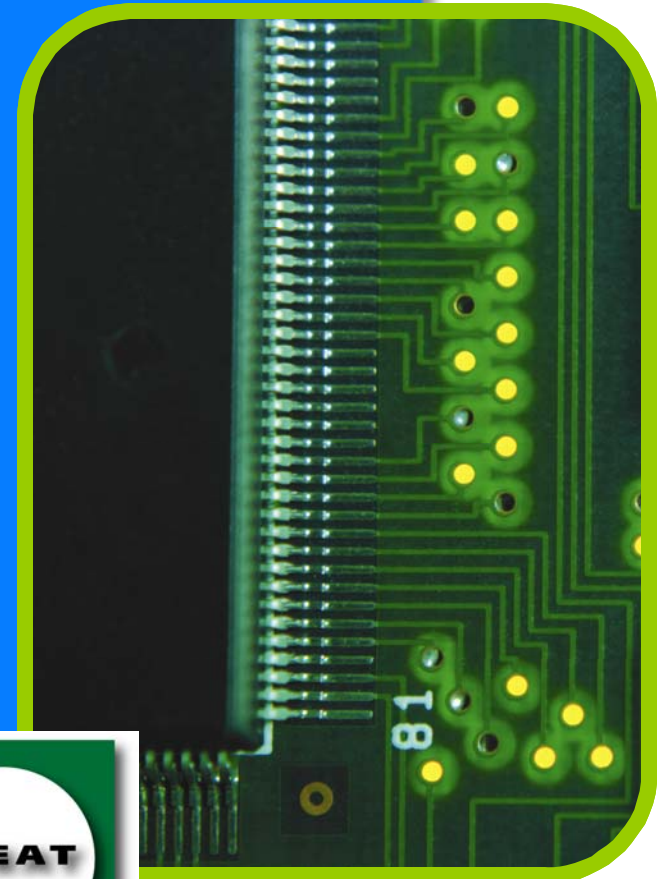
To recognize these benefits and promote greater electronics product stewardship, we're working to:

- Increase reuse and recycling of used electronics
- Ensure that management of used electronics is safe and environmentally sound; and



# Electronics Product Environmental Assessment Tool (EPEAT<sup>®</sup>)

An environmental procurement tool designed to help public/private sector institutional purchasers evaluate, compare & select desktop computers, laptops & monitors based on their environmental attributes.

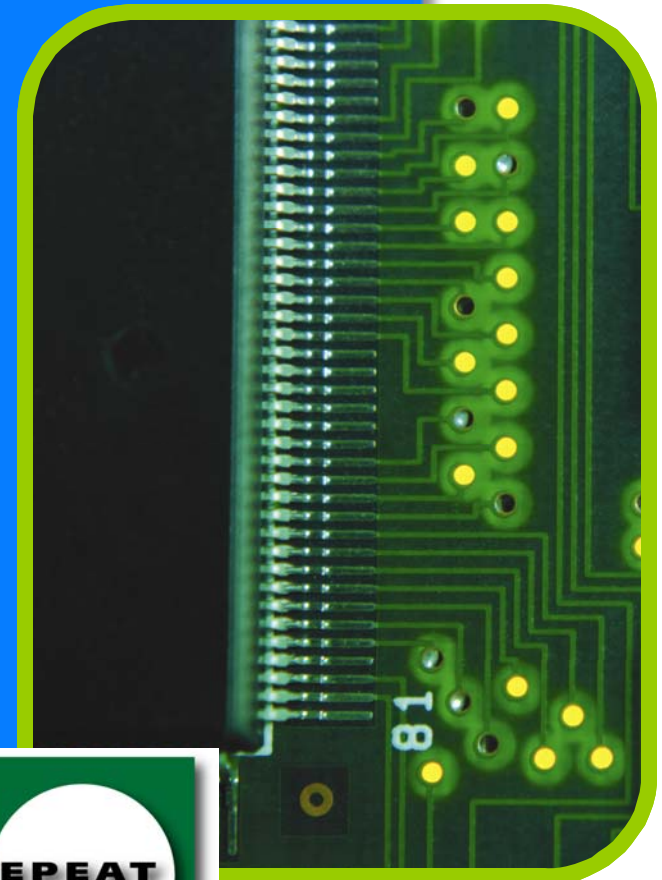




# Expanding EPEAT<sup>®</sup>

Environmental criteria is currently being developed for EPEAT standards covering two more product groups:

- Imaging Equipment
- Televisions



# Federal Electronics Challenge (FEC)

The FEC is a management challenge issued to federal agencies and facilities.

The challenge is designed to encourage agencies/facilities to:

- Purchase greener electronic products.
- Reduce impacts of electronic products during use.
- Manage obsolete electronics in an environmentally safe way.



[www.federalelectronicschallenge.net/](http://www.federalelectronicschallenge.net/)



# Plug-In to eCycling

Partnership Program between EPA and consumer electronics manufacturers and retailers that fosters opportunities for consumers to donate or recycle their used electronics.

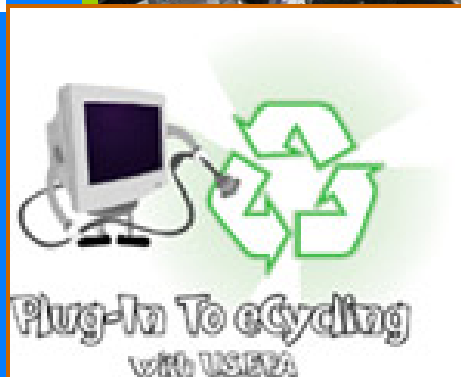
More information about the Plug-In to eCycling program: [www.epa.gov/plugin/](http://www.epa.gov/plugin/)



# Plug-In to eCycling Partners

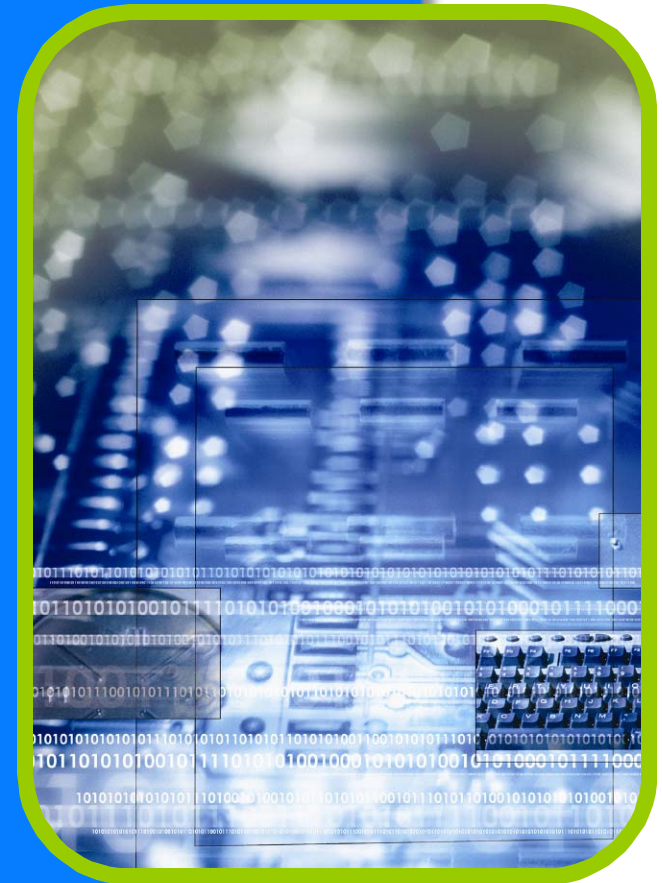


[www.epa.gov/plugin/](http://www.epa.gov/plugin/)



# Responsible Recycling Practices (R2)

Stakeholder effort to develop one set of practices to help electronics recyclers ensure safe and legal management of discarded electronics domestically & internationally.



# Scope of R2 Practices

Voluntary set of practices - recyclers are not required to be certified to R2

Covers electronics equipment including: computers, peripherals, cell phones & televisions

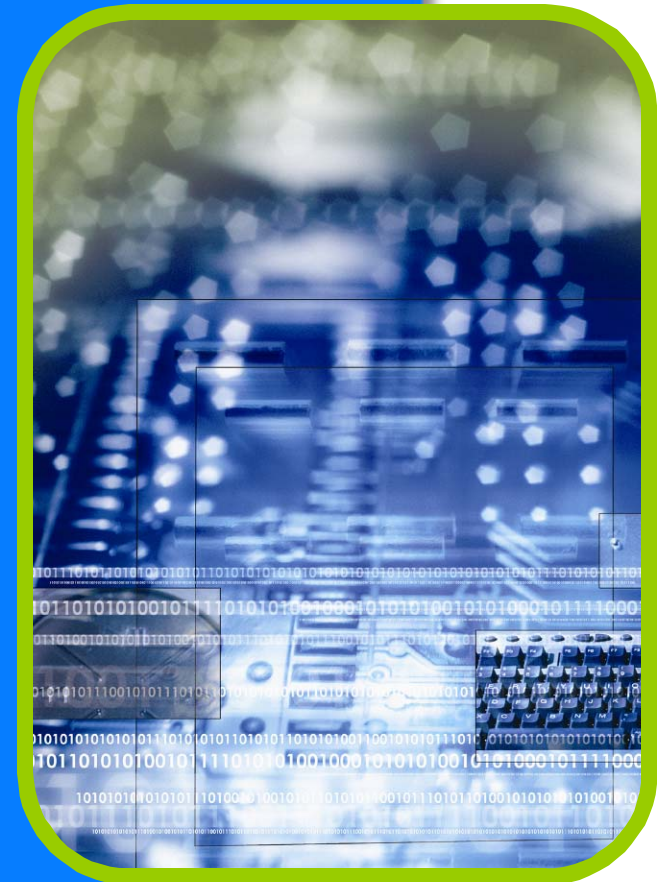
Materials getting specific “focus” include equipment and components containing:

- Cathode Ray Tubes

- Circuit boards

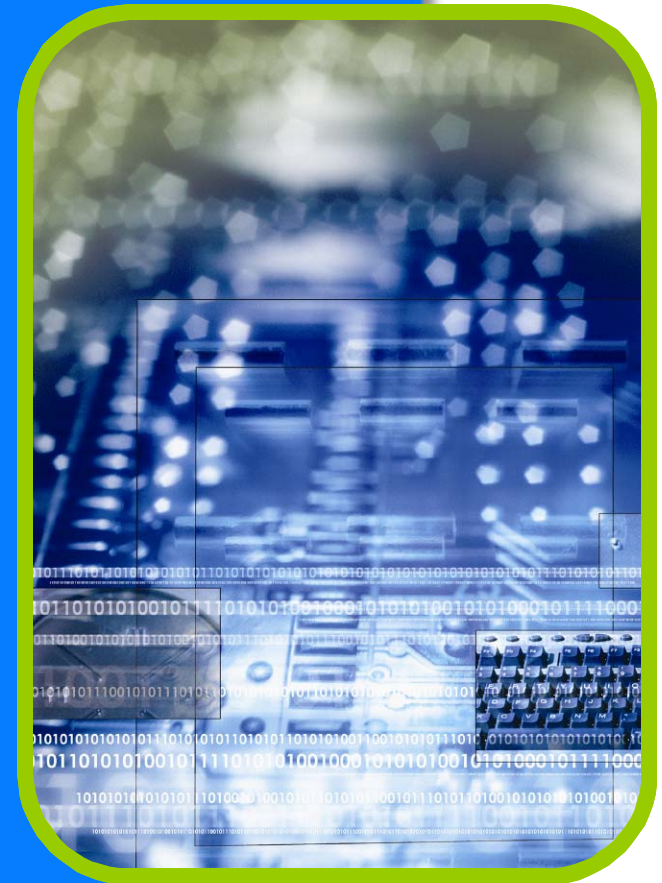
- Batteries

- Items containing mercury/PCBs



# Essential “R2” Concepts

- Reuse and Recycling Required
- On-site Worker & Environmental Protection
- Downstream Due-Diligence
- Evidence of Legality of Export & Import
- Comprehensive Management System
- Compliance with all Laws and Rules
- Data sanitization
- Tracking & recordkeeping
- Store and transport materials securely and safely
- Insurance, closure plans and financial mechanisms



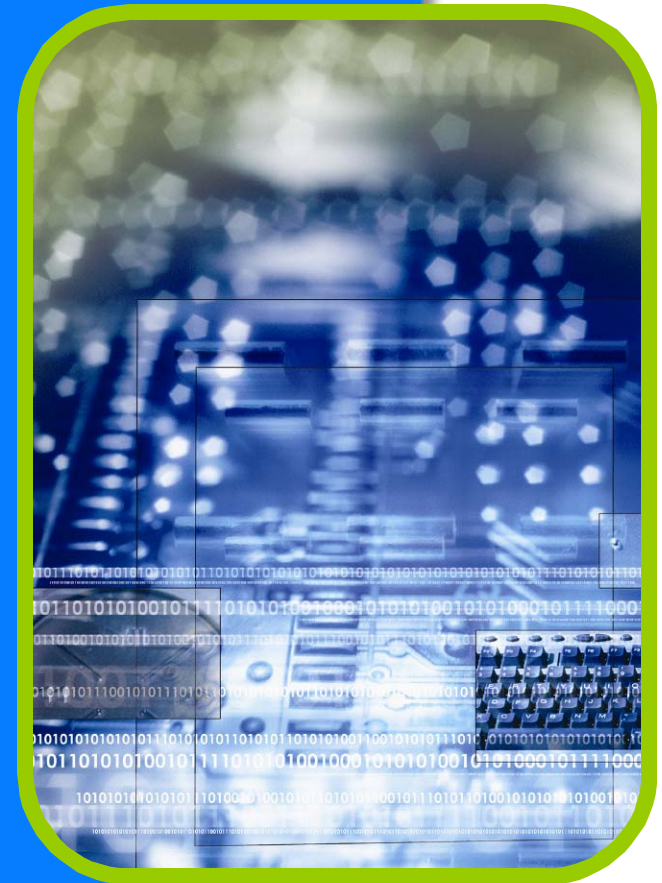
# Status: R2 Practices

Released on October 31, 2008

Posted on the internet:

[www.epa.gov/epawaste/conserva/materials/ecycling/r2practices.htm](http://www.epa.gov/epawaste/conserva/materials/ecycling/r2practices.htm)

R2 Working Group focused on certification process





# CRT Rule

- Streamlining the management of cathode ray tubes (CRTs)
- Conditional exclusions from the federal hazardous waste management standards for CRTs and CRT glass destined for recycling



[www.epa.gov/osw/hazard/recycling/electron/crt-fs06.htm](http://www.epa.gov/osw/hazard/recycling/electron/crt-fs06.htm)



# Export Requirements in the CRT Final Rule

- *Used CRTs (Broken and Intact) Exported for Recycling*
  - Notify EPA's Office of Enforcement and Compliance Assistance (OECA) of an intended shipment 60 days before the shipment.
- *Used Intact CRTs Exported for Reuse*
  - Submit a one-time notification to the appropriate EPA Regional Import-Export Coordinator with contact information and a statement that they are exporting the CRTs for reuse

[www.epa.gov/osw/hazard/international/crts/index.htm](http://www.epa.gov/osw/hazard/international/crts/index.htm)



# Universal Waste

- Universal wastes are hazardous wastes with special controls to facilitate treatment/recycling
  - Certain batteries
    - NiCd, Li, Pb acid
  - Lamps and other mercury devices
- State rules may be more stringent than EPA



*More information at:*

[www.epa.gov/osw/conservation/materials/recycling/docs/e-wasteregs.pdf](http://www.epa.gov/osw/conservation/materials/recycling/docs/e-wasteregs.pdf)



# Federal Requirements Governing Management of Used Electronics

- Resale or Donation
- Recycling CRTs
- Circuit Boards within the US
- Disposal CRTs and Other Electronics that Test “Hazardous”
- State Regulatory Requirements for Disposal of Electronics that Test “Hazardous”



# Regulations Governing Management of Used Electronics

- Federal Legislative Mandates for Electronics Recovery
- State Mandatory Electronics Recovery Programs



# Reports & Tools

Municipal Solid Waste Generation, Recycling and Disposal in the United States:  
Facts and Figures for 2007

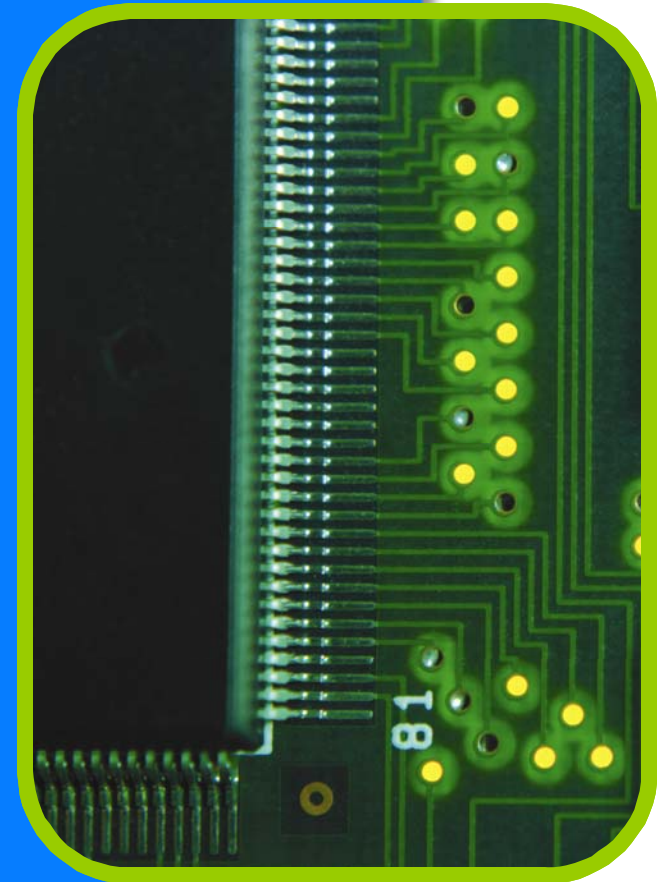
[www.epa.gov/osw/nonhaz/municipal/msw99.htm#links](http://www.epa.gov/osw/nonhaz/municipal/msw99.htm#links)

Management of Electronic Waste in the United States

[www.epa.gov/osw/conservation/materials/ecycling/docs/fact7-08.pdf](http://www.epa.gov/osw/conservation/materials/ecycling/docs/fact7-08.pdf)

Electronics Environmental Benefits Calculator

<http://isse.utk.edu/ccp/projects/benefitscalculator/elecbenefcalc.html>



# Contact Information

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