basel
action
network

turn back
the toxic tide

www.ban.org

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BAN Mission

basel action network

To prevent the globalization of the hazardous chemical crisis:

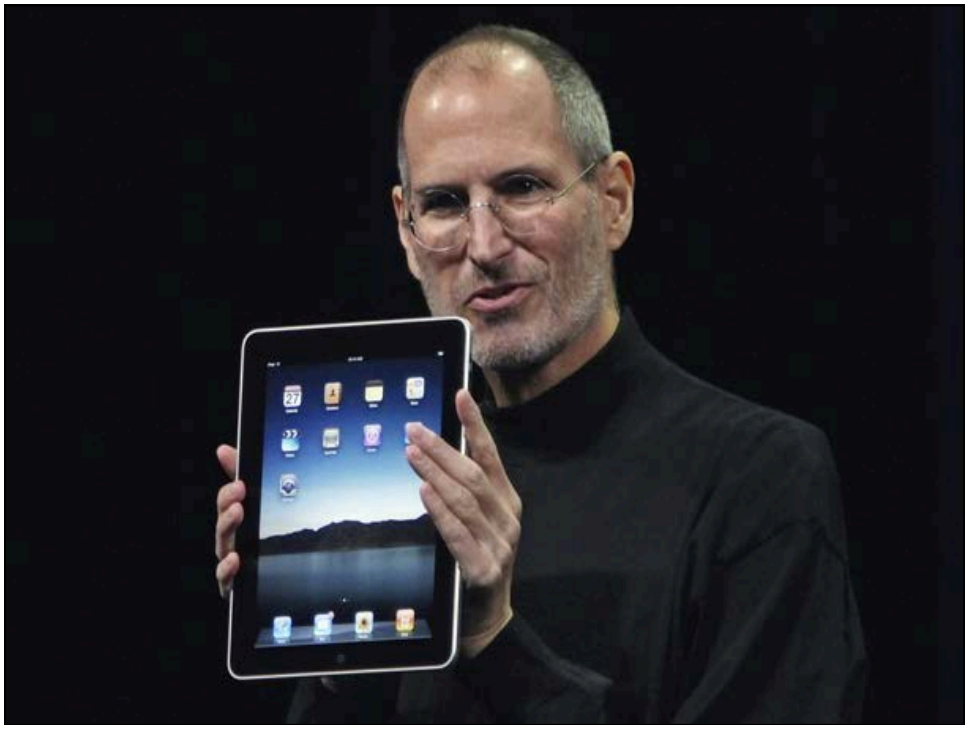
- <u>Prevent Toxic Trade</u> – the externalization of risk and costs to developing Countries.
- <u>Promote a Toxics-Free Future</u> -- through green design and minimizing consumption
- <u>Promote Global Environmental Justice</u> – where all have a right to a pollution-free environment.

The Digital Dump: How Our Electronic Gadgets are Poisoning the Planet

Jim Puckett, Basel Action Network (BAN)

Dept. Environmental and Occupational Health Sciences
University of Washington

OMG: What have we Done?



Hyper-Growth in IT Consumption

Growth in Computers / USA			
Year	Computers /1000 people	Rate of Increase	Number of Computers
1965	.1	--	19,430
1975	.9	9	200,000
1985	99	110	21,000,000
1995	342	3.5	90,093,000
2005	715	2.1	210,000,000
2009	900	1.25	274,500,000

Hyper-Obsolescence in IT Consumption

- Today's computer industry brings new technology and 'upgrades' to market every 18 months.
- **Unprecedented reasons:**
  - Rapid Innovation.
  - Rapid planned obsolescence, no $$ incentive for "longevity". Much $$ incentive getting you to buy new often – churning product. Flat Screens!
- Average life span of a personal computer now **2 years**. How many….

50 Million Metric Tonnes of e-Waste Generated Globally Last Year

E-Waste is Hazardous Waste

Hazardous e-Waste Constituents

- ***Toxic Metals***
  Lead, Cadmium, Mercury, Beryllium, Selenium, Lithium, Antinomy, Arsenic
- ***Brominated Flame Retardants***
  TBBA (tetrabromo-bisphenol-A)
  PBDE (polybrominateddiphenyl) etc.
- ***Other Halogenated Hydrocarbons***
  PVC (polyvinyl chloride)
  CFCs (chloroflourocarbons)
- ***Rare Earth Elements***
  Yttrium, Europium, Americium

Scaling Harm

- TVs or monitor CRTs contain 1.4 to 4.2 kilograms of lead
- 70% of the heavy metals (including lead, mercury and cadmium) found in landfills is derived from e-Waste.
- Circuit boards and Cathode Ray Tube (CRT) glass fail leachate tests for lead (ie. TCLP test)

Scaling Harm

- The average Cd content per computer is 2.8 Gms.
- Cd from one cordless phone battery is enough to pollute 600,000 liters of water.
- Global Cd consumption annually is 20,000 metric tonnes and 80 percent of that goes into Ni-Cd batteries.

Scaling Harm

- 50 million metric tonnes of e-waste = over 1,000,000 metric tonnes of lead.
- 50 million metric tonnes of e-waste = 3,350 tonnes of cadmium.
- e-waste in the US (2009) contained about 143,000 metric tonnes of lead.
- e-waste in the US (2009) contained about 214 metric tonnes of cadmium.

Divert from landfill to… recycling?


PC RECYCLE
SALES
SERVICE
NETWORKING
NEW & USED PARTS
TRADE-INS
RECYCLE
Take it BACK Network


ELECTRONICS-RECYCLING.COM
ELECTRONICS
RECYCLING
PH: 604-582-8087


3420
E. MARGINAL WAY S.
ARB
E-CYCLE TECHNOLOGY
EXHIBIT DESIGN CONSULTANTS


In USA 80% of e-Waste delivered to “recyclers” is exported to developing countries


Out of Sight…
EVERGREEN
Out of Mind?

Exporting Harm: The Dirty Little Secret of the High-Tech Industry

Guiyu, China 2001

Lagos, Nigeria 2005


FRANCE

Guiyu, China 2008/2009

Accra, Ghana 2009/10


PERSONAL DATA
PRIVACY ACT OF 1974
(5 U.S.C. 552A)

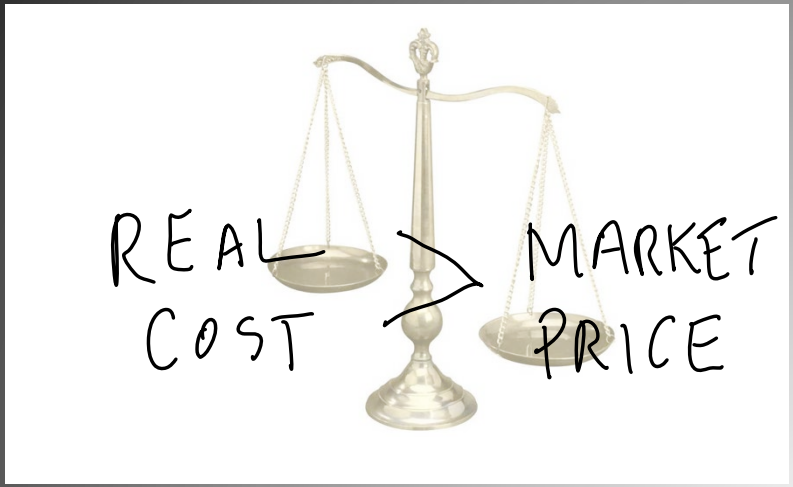
What's Wrong with this Picture?

The history of pollution is one of "cost externalization"

Costs Externalization

"Cost Externalization" is a distortion of economics where the market is allowed to do business without counting all of the true costs incurred as expenses – in particular costs or impacts on the global commons or disempowered communities -- for example, costs of extraction of natural resources, consumption of energy, materials and costs of the production and impacts of wastes.

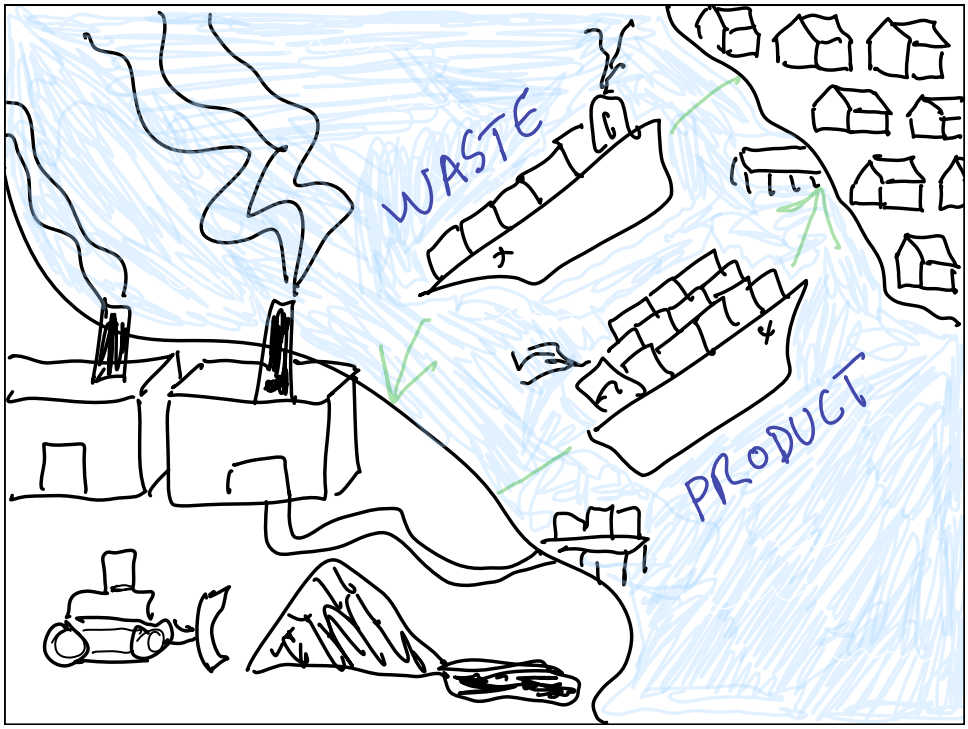
Costs Externalized



Pollution follows pathway of greatest cost externalization.


Cost Externalization
2
1
4
3
5…finding others to pay for the damage…


Cost internalization in developed countries via regulation…
X
X
X
X
…has led to externalization (exploitation) of developing countries.


WASTE
PRODUCT


Death Spiral:
The Electronics Industry's Harmful Externalities
Use
Disassembly
ELECTRONICS RECYCLING
Disposal/Recycling
Extraction
Production

Toxicological Findings -- Lab

Characterization of air emissions and residual ash from open burning of electronic wastes during simulated rudimentary recycling operations; *Gullet et al, National Risk Management Research Laboratory, US EPA, 2006.*

Findings: Lead emission concentrations from burning circuit boards exceeded U.S. municipal incincerator limits by over 200 times. An exceptionally high chlorinated dioxin/furan emission level was found from open burning of insulated wire. Likewise, the dioxin/furan emission factor from the circuit boards was also relatively high compared to other sources, such as from the burning of residential waste. Also very high brominated dioxin/furan emissions were produced from the circuit boards confirming the anticipated conversion of brominated flame retardants. These results suggest that significant health and environmental hazards could result from rudimentary recycling operations.

Toxicogical Findings -- Accra

Chemical contamination at e-waste recycling and disposal sites in Accra and Korforidua, Ghana; Kevin Brigden, Iryna Labunska, David Santillo & Paul Johnston, Greenpeace Research Laboratories Technical Note 10 / 2008.

Findings: At the open burning sites, some metals were present at concentrations over one hundred times typical background levels for soils, including lead. High levels of other toxic metals, including cadmium and antimony, were also present. Numerous classes of organic chemicals were also present including phthalates, polybrominated diphenyl ethers (PBDEs) and triphenyl phosphate (TPP), dioxins and PCBs.

Toxicogical Findings -- Accra

Assessing Worker and Environmental Chemical Exposure Risks at an e-Waste Recycling and Disposal Site in Accra, Ghana; Jack Caravanos, Edith Clark, Richard Fuller, Calah Lambertson

Findings: Personal air samples collected from workers and the environment revealed elevated levels for aluminum, copper, iron, lead and zinc. Of the 100 soil samples taken, more than half were above the US Environmental Protection Agency standard for lead in soil. The potential for human health impact is substantial both to workers and local residents.

Toxicogical Findings -- Guiyu

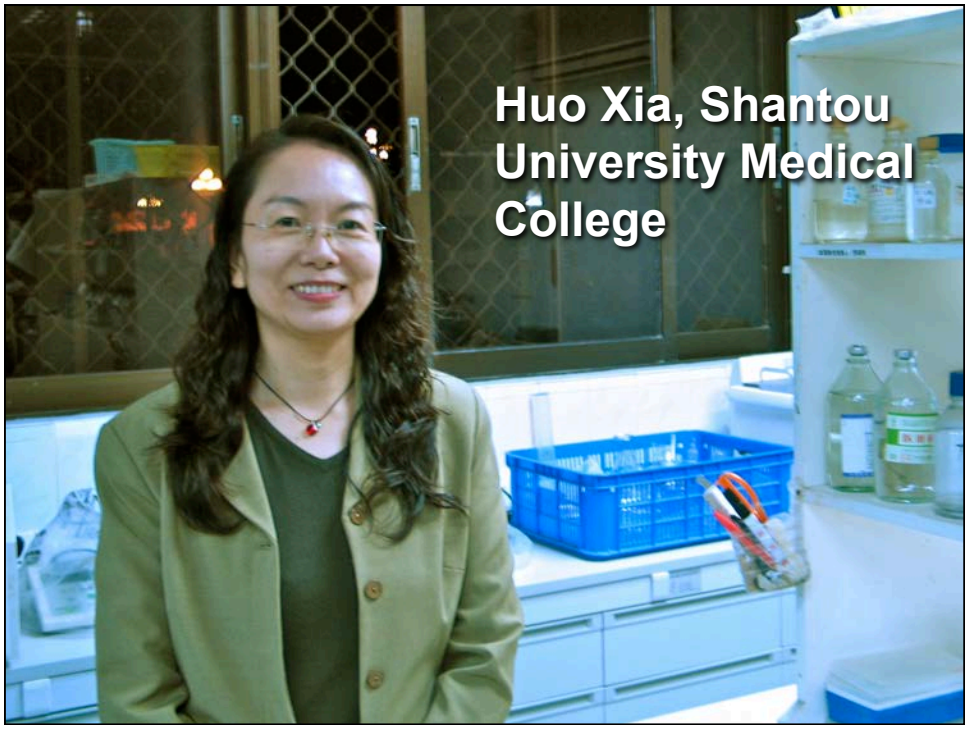
Heavy Metals Concentrations of Surface Dust from e-Waste Recycling and and Its Human Health Implications in Southeast China; *Anna O.W. Leung et al. Hong Kong Baptist University,* 2007

Findings: The recycling of printed circuit boards in Guiyu, may present a significant environmental and human health risk. Lead in road dust were 330 to 371 times higher, respectively, than non e-waste sites located 8 and 30 km away. Levels at the schoolyard and food market showed that public places were adversely impacted. Risk assessment predicted that Pb originating from circuit board recycling have the potential to pose serious health risks to workers and local residents of Guiyu, especially children, and warrants an urgent investigation into heavy metal related health impacts.

Toxicological Findings -- Guiyu

Comparisons of IL-8, ROS and p53 responses in human lung epithelial cells exposed to two extracts of PM2.5 collected from an e-waste recycling area in China; Fangxing Yang, Shiwei Jin, Ying Xu and Yuanan Lu, *Environmental Research Letters,* **2011**

Findings: The researchers exposed human lung epithelial cells to pollutants extracted from air samples taken from the vicinity of an e-waste dismantling industrial park in Taizhou, Zhejiang province, employing 60,000 people. They found that the cells showed signs of inflammation and oxidative stress – which can be precursors to cardiovascular disease, DNA damage and possibly cancer.



Toxicogical Findings -- Guiyu

Elevated Blood Lead Levels of Children in Guiyu, an Electronic Waste Recycling Town in China; *Xia Huo et al, Shantou University Medical College, 2007*

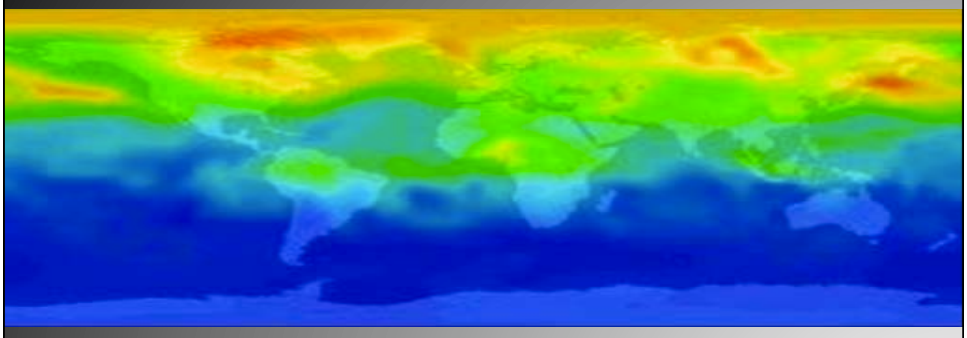
Findings: Children in Guiyu had lead levels in their blood that were more than 50 percent higher than the limit for lead exposure set by the Centers for Disease Control and Prevention in the United States and 50% higher than lead levels than among children in a neighboring village where used electronics were not dismantled.

Toxicogical Findings -- Guiyu

Elevated Blood Lead Levels of Children in Guiyu, an Electronic Waste Recycling Town in China; *Xia Huo et al, Shantou University Medical College, 2011*

Findings: The results showed 88 percent of the 167 children - all younger than 6 - tested had lead poisoning in 2010. That's a surge compared to the 16 percent rate among the 227 children tested in 2009. Most of the children with high BLLs also have attention deficit and behavioral problems.

Long-Range Transport of Air Pollution



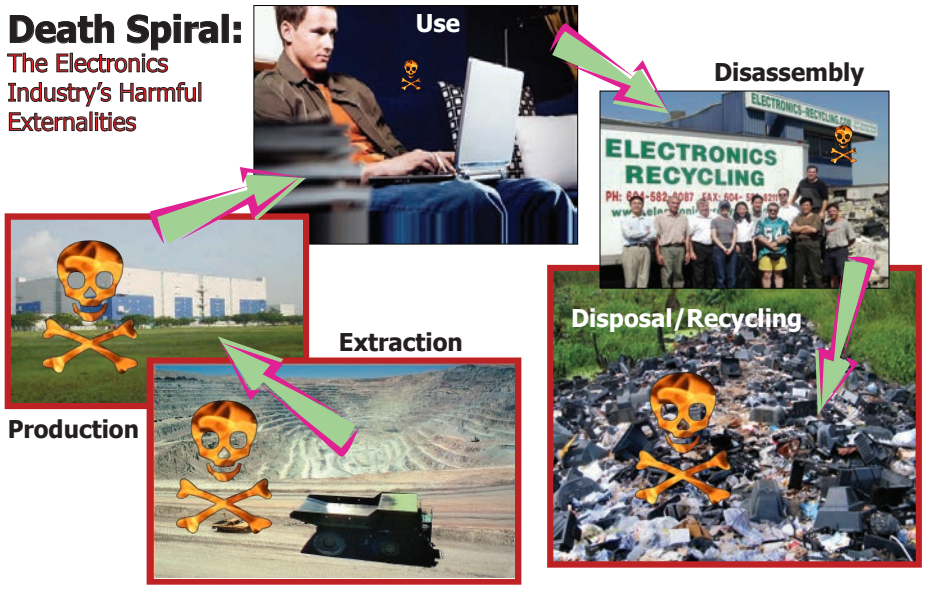
~40% of all Hg deposition to the lower 48 states comes from emission sources outside the U.S. or from U.S. emissions that have been transported across international boundaries

[EPA, 1997]

Taking Responsibility

Life Cycle Responsibility

1. **Manufacturer Responsibility** -- (Preventing Cost Externalization at Design Stage) Design for Recycling, Toxics Use Reduction
2. **Consumer Responsibility** -- Buy or Lease Toxic-Free, Energy Efficient, Long Lasting Products, Use Responsibly, Dispose of Responsibly
3. **National Responsibility** (Preventing Cost Externalization via landfilling, or export "aka cheap and dirty dumping")



The Design Stage

Where Externalities are Planned…
or Not

The eco-label we want to see

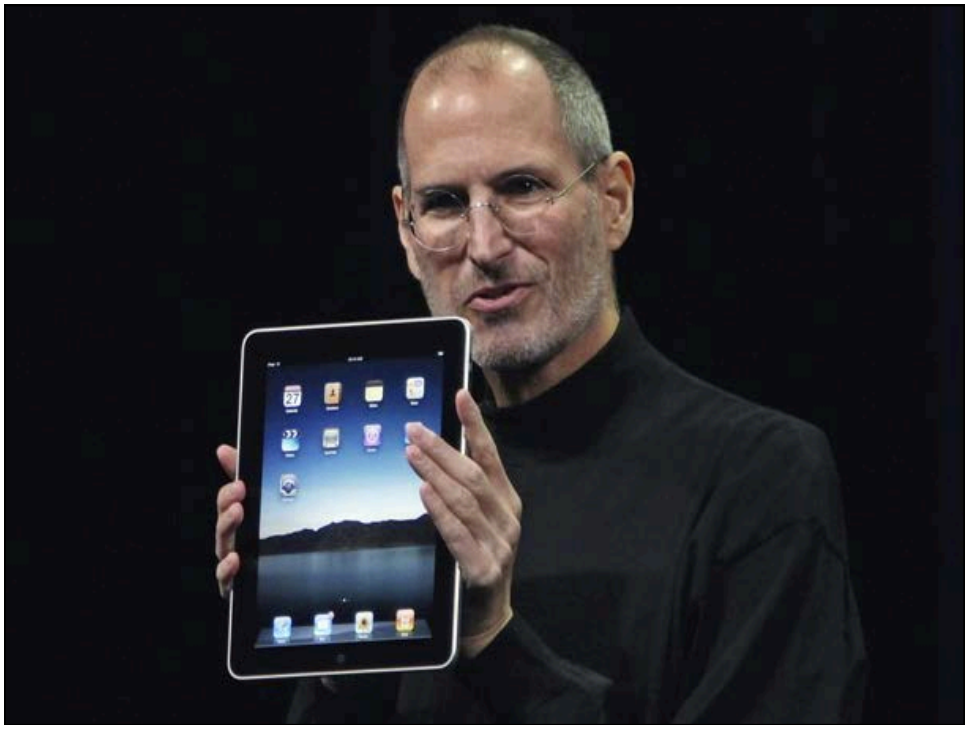
CERTIFIED
ToxicFree™
PRODUCT

50 Million Metric Tonnes of e-Waste Generated Globally Last Year

How soon can we have a toxics-free computer?

- **Robert Pfahl Jr.,** Vice President of Operations INEMI
- **International Electronics Manufacturing Initiative:** is an industry-led consortium of approximately 70 electronics manufacturers, suppliers and related organizations.
- **Mission:** to assure leadership of the global electronics manufacturing supply chain.

2015!



The use of toxic chemicals in products and in production

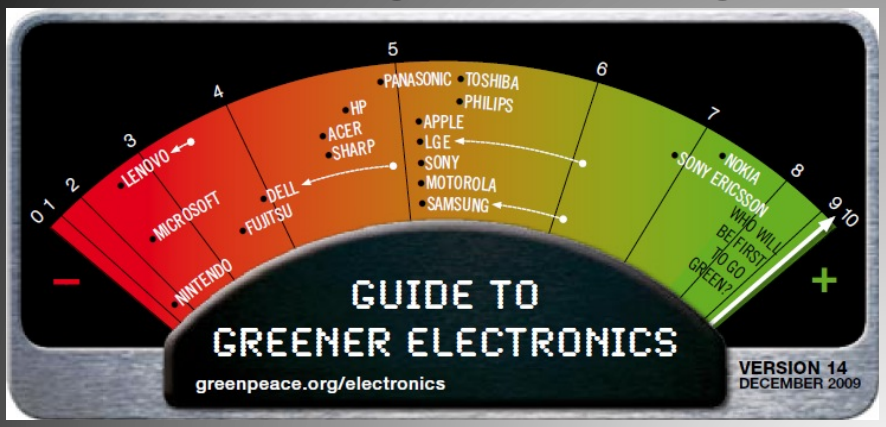
Toxics IN

is a Toxics OUT.

Electronics Life Cycle Challenges

1. Manufacturer Responsibility -- (Preventing Cost Externalization at Design Stage) Design for Recycling, Toxics Use Reduction
2. Consumer Responsibility -- Buy or Lease Less Toxic, Energy Efficient, Long Lasting Products, Use Responsibly, Dispose of Responsibly
3. National Responsibility (Preventing Cost Externalization via landfilling, or export "aka cheap and dirty dumping")

Buy Green
Reward Companies that Internalize Costs through Green Design

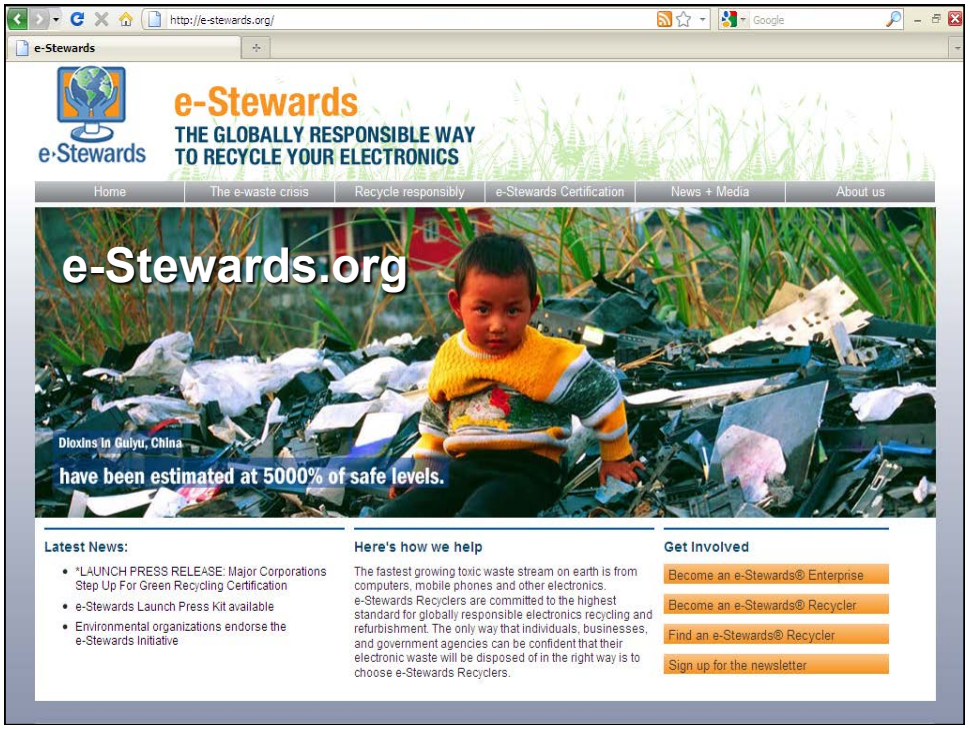


www.greenpeace.org

Buy Green
Reward Companies that Internalize Costs through Green Design

www.epeat.net

Using only the Most Responsible Recyclers



Find e-Stewards

e-Stewards Enterprises

15 April 2010 Launch

e·Stewards
enterprise

BAN congratulates the following inaugural e-Stewards Enterprises who are
committed to responsible recycling of their electronic e-waste.

APOLLO GROUP
Bank of America
CapitalOne
IDEA
Nemours.
PREMIER
Premier Farnell
resource media
SAMSUNG
sprout creation
STOKES LAWRENCE
WELLS FARGO

Enterprise Program Growing:
13 → 47 in 18 months

LG

Bloomberg

ALCOA

THE COUNTY OF SANTA CLARA

NVIDIA

King County

Nestlé

Being a responsible consumer means buying conscientiously…

and recycling conscientiously.

Electronics Life Cycle Challenges

1. **Manufacturer Responsibility -- (Preventing Cost Externalization at Design Stage) Design for Recycling, Toxics Use Reduction**
2. **Consumer Responsibility -- Buy or Lease Toxic-Free, Energy Efficient, Long Lasting Products, Use Responsibly, Dispose of Responsibly**
3. **National Responsibility (Preventing Cost Externalization via export "aka cheap and dirty dumping")**

USA's Runaway Export Train

Basel Convention

BASEL CONVENTION

Adopted 1989

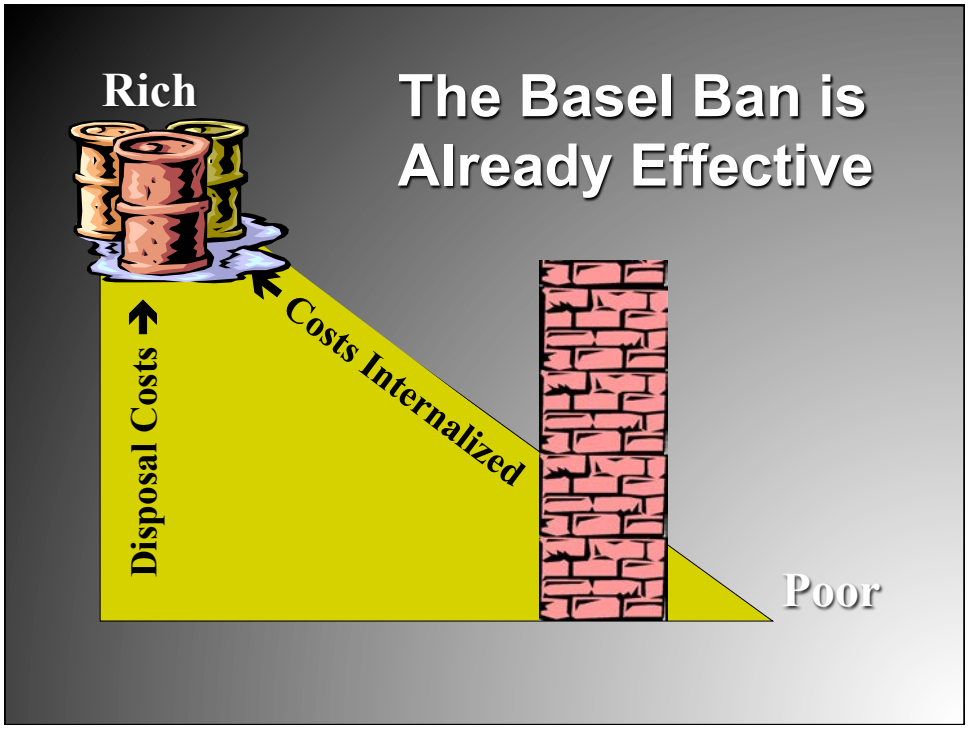
Basel Ban Amendment

BASEL CONVENTION

Adopted 1995

Basel Ban Amendment

- Prohibits the export of hazardous waste (for recycling or disposal) from the OECD, EU, Liechtenstein (Annex VII) to all other countries.
- Not in global force (not yet added to the Convention text) but with 69 ratifications
- Most importantly, implemented into the national laws of 33 of the 41 developed countries to which it applies.



The 41 Annex VII Countries of the Basel Ban

Implementing/Ratified Ban (33)		Implementing Basel Convention (7)
Austria	Malta	Australia
Belgium	Netherlands	Canada
Bulgaria	Norway	Israel
Chile	Poland	Japan
Cyprus	Portugal	Mexico
Czech Republic	Romania	New Zealand
Denmark	Slovak Republic	South Korea
Estonia	Slovenia	
Finland	Spain	
France	Sweden	
Germany	Switzerland	
Greece	Turkey	
Hungary	United Kingdom	
Iceland		
Ireland		
Italy		
Latvia		
Liechtenstein		Neither (1)
Lithuania		
Luxembourg		United States

"50 to 100 Containers of e-Waste per day Arriving in Hong Kong"

United States Government Accountability Office

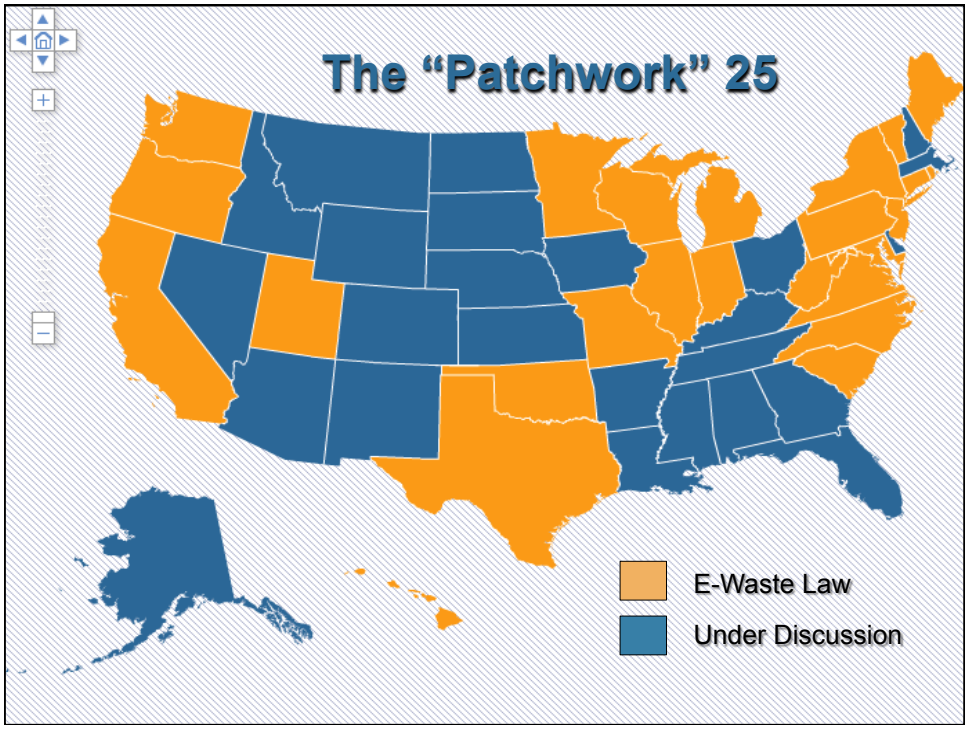
GAO

Report to the Chairman, Committee on Foreign Affairs, House of Representatives

August 2008

ELECTRONIC WASTE

EPA Needs to Better Control Harmful U.S. Exports through Stronger Enforcement and More Comprehensive Regulation



State Laws Cannot Address Export Issue

- **25 States now have e-Waste Legislation.**
- **Unconstitutional to control e-Waste exports**
- **Yet all of them will ensure more waste is collected and diverted from landfills**
- **Thus more US e-waste will be exported…**

→ So, USA, as a nation is increasingly diverting e-waste from lined, leachate controlled landfills, and sending it to the rice paddies of China and burning dumps of Africa.

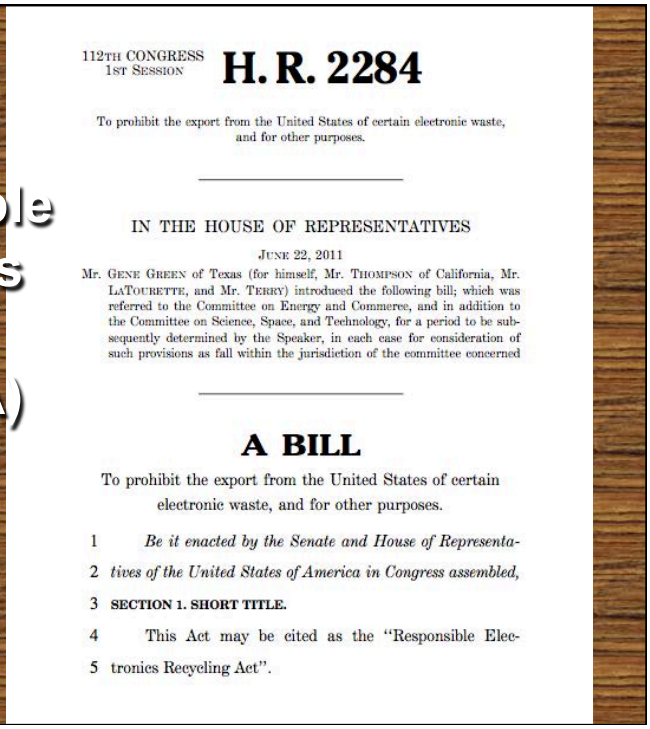
Latest GAO Findings

- ***"Assuming a continuation of the factors that contribute to exports… an increase in collection rates resulting from electronics recycling laws, either at the state or federal level, is likely to lead to a corresponding increase in exports, absent any federal restrictions."***

US Federal Export Controls?

- Has not ratified Basel Convention
- Has not ratified Basel Ban Amendment
- Now only has the "CRT rule" – But this is easily circumvented by exporters
- Its illegal for Basel Parties (178) that are not part of OECD (34) group to import HW from the US
- US policy and laws don't respect other country's laws.

Responsible Electronics Recycling Act (RERA)



112TH CONGRESS
1ST SESSION

H. R. 2284

To prohibit the export from the United States of certain electronic waste, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 22, 2011

Mr. GENE GREEN of Texas (for himself, Mr. THOMPSON of California, Mr. LATOURETTE, and Mr. TERRY) introduced the following bill; which was referred to the Committee on Energy and Commerce, and in addition to the Committee on Science, Space, and Technology, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To prohibit the export from the United States of certain electronic waste, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Responsible Electronics Recycling Act".

Time to say NO to…

global toxic design.

Time to say YES to…

a toxic free future for all.

basel
action
network

turn back
the toxic tide

www.ban.org