E-WASTE: The Exploding Global Electronic Waste Crisis

AN ISSUE BRIEFING BOOK

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Electronics TakeBack Coalition

TAKE IT BACK. MAKE IT GREEN.
RECYCLE RESPONSIBLY.

The Problem: The Looming E-Waste Tsunami

What's the Problem?

- **The electronics we buy don't last very long**
- **Electronic equipment contains many toxic materials**
- **More e-waste is thrown in the trash than recycled**
- **Toxic components and poor design make e-waste hard to recycle**
- **Most recyclers export the products to developing countries with no worker safety or environmental protections**

Growing sales, shrinking life-spans

Each year, we scrap 400 million units of electronics in the US, according to the recycling industry.[1]

The world has been dazzled by advances in the electronics industry and the amazing products we now depend on in our everyday lives. But rapid advances in technology mean that electronic products are becoming obsolete more quickly. Shorter product life-spans, coupled with explosive sales in consumer electronics, mean that more products are being disposed of, and discarded computers, TVs, and other consumer electronics (so-called e-waste) are now the fastest growing waste stream in the U.S.[4]

In 2009, Americans bought 34.5 million digital TVs.[2]

The sheer volume of e-waste is a looming tsunami, already spilling over into our landfills and incinerators, with no end in sight. Local governments must spend more of their scarce tax dollars to cope with the e-waste volumes, either as trash or through municipal recycling programs.

In 2009, 67 million computers will be sold in the US and 313 million computers will be sold worldwide.[3]

Out with analog, in with digital

To make matters worse, the FCC helped to hasten planned obsolescence for TVs by mandating the transition to digital television on June 12, 2009.

The "digital conversion" meant that millions of older TVs would no longer receive any signal, and consumers had to either buy a digital set-top converter box or a brand new TV in order to get over the airways reception. Millions of old TVs ended up in the trash (or tucked into garages and basements) as consumers opted for new flat panel TVs. And there is little demand for old (analog) tube TVs.[5]

E-Waste Is Toxic Waste

E-waste contains toxic materials harmful to humans and our environment. Over 1,000 materials, including chlorinated solvents, brominated flame retardants, PVC, heavy metals, plastics and gases, are used to make electronic products and their components - semiconductor chips, circuit boards, and disk drives.

CRT monitors and TVs contain between four to eight pounds of lead. [6] As they break down in a landfill, they can leach toxic chemicals into groundwater. This has led some states to ban them from their landfills.

Now with LCDs dominating the TV market, we face mercury contamination problems, since LCDs use mercury lamps to light their screens. Milligrams of mercury are used in each LCD, but it is so toxic that as little as one gram of airborne mercury deposited per year to a 20-acre lake is enough to maintain mercury contamination at a level where the fish are unsafe to eat. About 40% of the heavy metals, including lead, mercury and cadmium, found in landfills come from electronic equipment discards.

Lead: The health effects of lead are well known; lead exposure causes brain damage in children and has already been banned from many consumer products.

Mercury: Mercury is toxic in very low doses, and causes brain and kidney damage. It can be passed on through breast milk. In a 2000 report, the National Academy of Sciences estimated that over 60,000 babies are born each year at risk for neurodevelopmental (nervous system) defects associated with high exposure to methylmercury in the womb.[7]

Cadmium: Cadmium is a known cancer-causing substance.[8] It accumulates in the body and can cause kidney damage.

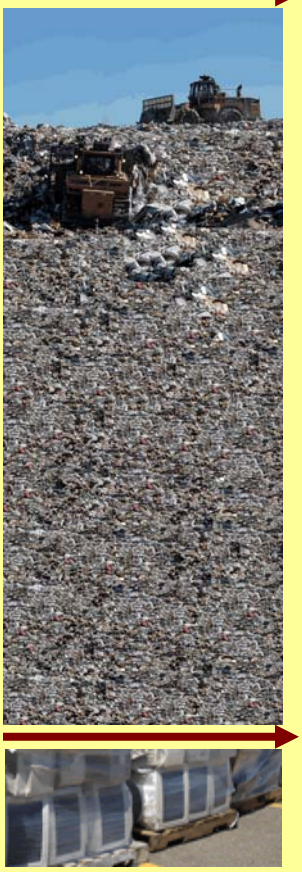
BFRs: Brominated flame retardants (BFRs) may seriously affect hormonal functions critical for normal development. A recent study of dust on computers in workplaces and homes found BFRs in every sample taken. One group of BFRs has been found in alarming rates in the breast milk of women in Sweden and the U.S. Incineration of plastics containing BFRs generates toxic brominated dioxins and furans.

Plastics Plastics, including PVC, make up to 13.8 pounds of an average computer. Plastics are used in printed circuit boards, in connectors, plastic covers & cables. Hazardous chemical additives (like phthalates)can leach when PVC components of electronic products are landfilled, and burning PVC produces dioxins, a group of the most potent synthetic chemicals ever tested, which can harm the immune and reproductive systems, and some of which are known to cause cancer.[9] The U.S. EPA estimates that levels of dioxin contamination in the general population is at or near the level at which adverse health effects can be observed in both humans and animals. PVC manufacture and disposal adds to both the phthalate and dioxin body burden in all of us.[10]

Beryllium Beryllium is commonly found on motherboards and connectors. Beryllium is a human carcinogen[11].

Trashed or Recycled?
Most Toxic E-Waste Ends Up In Our Landfills

Total E-Waste Generated Annually **3,160,000 Tons total**



Trashed: 86.4%

2.73 million tons of e-waste ends up in landfills or incinerators

Recycled: 13.6%

Only 430,000 tons are collected for recycling

The EPA estimates that in 2008, the U.S. generated 3.1 million TONS of e-waste. But only 14% of that was collected for recycling.

The other 86% went to landfills and incinerators. Hazardous chemicals in e-waste can leach out of landfills into groundwater. Burning the plastics in electronics can emit the carcinogen dioxin.

These numbers don't include the millions of stockpiled computers, monitors and TV - which are stored in basements, garages, offices, closets and homes awaiting a decision.

Source: EPA Office of Solid Waste, 2009[12]

Federal laws make it **legal** for households and most small business **to throw most e-waste into the municipal landfill**. But States are passing laws to keep e-waste out of the trash.

These states have passed laws banning some form of e-waste from their landfills and incinerators:[13]

- California
- Connecticut
- Illinois
- Indiana
- Maine
- Massachusetts
- Minnesota
- New Hampshire
- New Jersey
- New York
- North Carolina
- Oregon
- Rhode Island
- Vermont
- Wisconsin

Dumping Our E-Waste In Developing Countries

Woman in Guiyu, China, about to smash a cathode ray tube from a computer monitor, to remove the copper yoke at the end of the funnel. The glass is laden with lead, but the biggest hazard from this is the inhalation of the highly toxic phosphor dust coating inside of the CRT. © Basel Action Network 2001

Most "Recyclers" Don't Recycle Our E-Waste - They Export It To Developing Countries

Currently, a large portion of the hazardous electronic waste collected for recycling in the U.S. is actually exported to developing countries. There the products are dismantled and separated using such crude and toxic technologies that workers and communities are exposed to many highly toxic chemicals.

In countries like China, India, Viet Nam, and Pakistan, workers in e-waste yards (working with few health and safety protections) actually "recycle" very little of these products – they use hammers, acids, and open burning to reclaim minimal materials and dump the rest.

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

Circle of Poison:
Toxic Jewelry From China

Lead from e-waste, which also contains copper, tin and antimony, has been found in lead-tainted children's jewelry made in China and imported back into the U.S. [14]

In one e-waste processing region in China, more than 80% of the children have lead poisoning, the water is unsafe to drink, and the workers have extraordinarily high levels of toxic fire retardants in their bodies.[15]

Waste traders can make more money by exporting toxic e-waste to countries where workers earn extremely low wages (ten cents per hour) and where health and safety laws are very weak, or are not enforced.

The Myth of Reuse

Waste Traders Sell Non-Working Units Under Pretense of Reuse

Roadside e-waste dump in Lagos, Nigeria.

Nigeria Reuse Market Flooded With Trash E-Waste

Lagos, Nigeria has a vibrant reuse market and a skilled workforce for refurbishing used electronics. But as much as 75% of the electronics in the containers they receive from the U.S. and Europe cannot be resold or refurbished because they are scrap or very obsolete.

Instead, they are tossed into unregulated dumps – and then burned when the piles get too big, emitting deadly dioxin and furans. All of this happens right next to residential areas, exposing residents to toxic fumes on a regular basis. [16]

In Nigeria, scrap electronics are piled up and burned, emitting deadly dioxin.

Our Federal Laws Don't Prevent E-Waste Export

While importing e-waste from the U.S. violates the laws of many of the importing countries, it is not a violation of U.S. laws to export if from the U.S. But that was not always the case.

Many of the materials in e-waste were once considered "hazardous" under U.S. laws, and therefore covered by Resource Conservation and Recovery Act (RCRA) laws. RCRA requires EPA oversight of hazardous waste exports. Under this law, the EPA must get the importing country's consent before allowing the shipment to leave the U.S.

But now, very little e-waste is covered by RCRA's notice and consent procedures. Over the years the EPA has weakened the rules, both by removing many of these materials from the definition of "hazardous" and by creating loopholes for materials being exported for alleged "recycling." So now, we have almost no restrictions on e-waste exports from the U.S.

Photo © Basel Action Network 2005

Exemptions in the federal laws that allow e-waste to be exported with little oversight:

- Circuit board exemption
- Scrap metal exemption
- Precious metal exemption
- Recycling exemption

U.S. Prison E-Waste Recycling Plants

Some recyclers and many federal government agencies send their e-waste to recycling plants operating in one of eight federal prisons. The recycling facilities are operated by UNICOR, a wholly-owned subsidiary of the federal Department of Justice. By paying prison workers as low as 23 cents per hour, UNICOR underbids and undermines private commercial recyclers, who simply can't compete with UNICOR's low rates. But even more alarming is UNICOR's track record on worker health and safety issues (for inmates and prison staff) in the recycling shops. Following a staff whistle blower complaint, UNICOR is currently under investigation by the federal Inspector General. **Federal investigators recently found airborne levels of lead at 50 times the legal limits and cadmium at 450 times the federal legal limits at UNICOR's Elkton, Ohio facility.**[17]

UNICOR has e-waste recycling facilities in the following federal prisons:

- Atwater, CA
- Elkton, OH
- Ft. Dix, NJ
- Leavenworth, KS
- Lewisburg, PA
- Marianna, FL
- Texarkana, TX
- Tucson, AZ

Two Policy Solutions to the E-Waste Crisis

- **Producer Responsibility for Recycling**
- **Ban Global E-Waste Dumping**

Policy Solution 1:
Producer Responsibility For Recycling

What is Producer Responsibility?

Currently, many state and local governments shoulder the burden of dealing with e-waste. Whether it's administering a collection and recycling system, building landfills, or cleaning up dumped waste on the side of the road, taxpayers are currently the ones paying for the exploding costs of e-waste.

Under a producer responsibility system, the manufacturers – not consumers or government – take responsibility for the environmentally safe management of their products when they are no longer useful or are discarded.

Giving the manufacturers the financial responsibility for managing their old products gives them a strong incentive to redesign their products to remove the toxic materials that make recycling challenging and expensive. And unless we make the products less toxic, we will never be able to fully recycle the materials back into new products.

Some Companies Are Taking Responsibility Voluntarily

Most of the computer and TV companies have launched voluntary programs to take back and recycle their old products. But many of these voluntary efforts are simply not convenient enough for consumers to use them widely. So starting in 2003, states began passing laws mandating producer responsibility for e-waste collection and recycling.

Dell has been the leader among computer companies in developing a convenient network of collection sites across the country, by partnering with Goodwill and Staples.

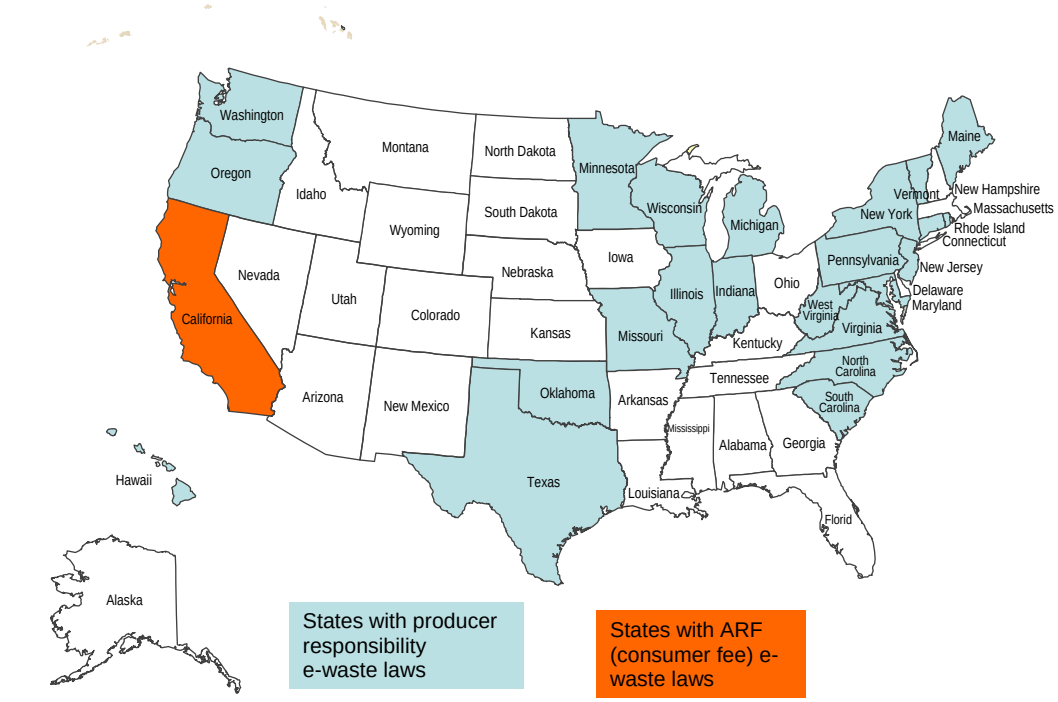
DELL + goodwill = Dell Reconnect

Legislation for Producer Responsibility

Twenty three states have passed legislation mandating that manufacturers offer free e-waste collection and recycling programs as a condition of selling in their states. (California also has a statewide program, but it is funded via consumer-paid fees, not by the manufacturers.) Takeback bills are being considered in more states.

Some of these states have passed "mild" laws, which don't set collection or convenience goals for the manufacturers, and those are not seeing high recycling volumes. But states with strong laws are getting very strong results and high volumes of recycling. More info here.

23 States Have Passed Producer Responsibility E-Waste Laws



23 have passed producer responsibility laws so far:

- Connecticut
- Hawaii
- Illinois
- Indiana
- Maine
- Maryland
- Michigan
- Minnesota
- Missouri
- New Jersey
- New York
- North Carolina
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- Texas
- Vermont
- Virginia
- Washington
- West Virginia

What about federal takeback legislation?

The electronics industry has opposed proposals for strong federal producer takeback legislation – bills that would set goals or mandate convenience requirements in order to promote high levels of e-waste collection. So all the legislative activity has been at the state level.

Policy Solution 2: Ban Global E-Waste Dumping

As state legislation and voluntary efforts divert more e-waste, out of our landfills and into the hands of recyclers, we need to take action to stop these recyclers from simply shipping our e-waste to developing countries, where they cause great harm. This can only be accomplished by federal legislation that prevents the export of toxic electronic waste to developing countries. That is the law in all of Europe - it's illegal to ship hazardous waste from any EU country to developing nations.

A bill to outlaw exporting toxic e-waste from the U.S. to developing nations was introduced in the fall of 2010 (HR 6252). It is likely to be reintroduced in the new Congress. We believe this is the most significant single thing the federal government could do to address the e-waste crisis.

For more information on the export issue, see our Export Briefing Book.

About the Electronics TakeBack Coalition

The Electronics TakeBack Coalition is a national coalition of organizations promoting sustainable and responsible practices throughout the high-tech electronics industry, to protect public health and the environment. Partner Organizations are Basel Action Network, Center for Environmental Health, Clean Water Action, Silicon Valley Toxics Coalition and Texas Campaign for the Environment. For a list of member organizations, please see our website.

For More Information

For more information on the e-waste issue, including the details of current state bills, and our "Facts and Figures on E-Waste," go to www.electronicstakeback.com.

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