

Use Your Remote Control: Help Stop the Global E-Waste Crisis

Digital TV Expected to Generate a Flood of E-waste

On February 17, 2009, the U.S. switch from analog to digital television (DTV) will make millions of televisions obsolete.¹ With less than one year to go before the change, the Silicon Valley Toxics Coalition (SVTC) and the Electronics TakeBack Coalition (ETBC) are calling on consumers to take action against this potential flood of toxic electronic waste (e-waste) by asking manufacturers to take back their obsolete products and ensure that they are recycled safely and responsibly. We are also calling on manufacturers to protect workers by reducing the amount of toxic materials used to make their products.

TVs contain many of the same toxic materials found in computer e-waste. Although a small percentage of discarded computers and TVs are recycled responsibly, most are either dumped in local landfills or shipped to developing nations for dismantling under conditions that threaten human and environmental health. In addition, a significant amount of U.S. e-waste is recycled using prison labor in this country.

Although the increase in e-waste will be the most obvious impact of the DTV switch, the manufacturing of millions of new digital TVs also spotlights the dangers faced by workers who manufacture and assemble electronic products. Hazardous chemicals such as mercury and toxic brominated flame retardants are among the materials that threaten the health of those workers and their communities.

SVTC is urging consumers to promote safe recycling practices by encouraging manufacturers to take responsibility throughout the lifecycle of their products. This includes safe production, use, and end-of-life recycling and disposal. We are also recommending that people with older analog equipment install converter boxes to keep their TVs in service as long as possible.

To find out what you can do, please visit SVTC's website at www.svtc.org and click the Tune In link.

TVs Go Digital—The Story Behind the Switch to DTV

According to the Federal Communications Commission (FCC), the switchover is occurring because the digital television signal is virtually free of interference and more efficient than analog, thereby improving picture and sound quality while using less bandwidth. That increased efficiency will free up broadcasting bands for public safety

and emergency services, and additional frequencies will be auctioned to wireless companies so they can expand services like wireless broadband.²

Back in the 1980s, AT&T, General Instrument Corp., MIT Electronics, Philips, the David Sarnoff Research Center, Thomson Consumer Electronics, and Zenith begin to explore the possibility of digital television. In 1993 they banded together to form a group called the “Grand Alliance,” and by 1994 they had created a digital television system.³

The FCC approved the transition from analog to digital in 1996.⁴ In 1997, Congress approved the switchover despite concerns from some members of the House Committee on Energy and Commerce about the impact of such “forced obsolescence” on consumers.^{5,6} In 2006, Congress set February 17, 2009, as the date for the change.⁷

If you have an older, non-digital TV and you currently receive your TV signal through a rooftop or “rabbit ear” antenna (i.e. not through cable or satellite), you will need either a converter box or a new TV to receive over-the-air programs after the DTV switch occurs. A couple of notes: First, digital broadcasting is already happening along with the analog signal, but on February 17, 2009, all full-power TV stations will stop their analog signals. Second, DTV is not the same as HDTV. DTV is the basic technology that makes HDTV possible, but you will need HDTV equipment to receive an HDTV signal.

The FCC seems to be doing its best to drum up both consumerism and optimism with their “Get It, Tomorrow’s TV Today” tagline.⁸ But according to a Consumers Union survey, 74 percent of those who said they were aware of the upcoming transition had serious misconceptions about how they would be affected, including nearly 25 percent who believe they will need to throw away their analog television sets—which is not the case.⁹

The survey found that about 15 percent of people in the U.S. live in households that rely exclusively on over-the-air programming. If these consumers do not take some action before February 2009—such as buying a converter box or new TV—over three quarters of them (those who do not already own DTV equipment) will be unable to receive TV programming.¹⁰

For many low-income families the cost of the converters will pose a financial burden. The estimated purchase price per box is estimated at between \$50 and \$70, and the federal government is giving away \$40 coupons (up to two per household) to help offset the cost. Each coupon is good for just one converter box, however, and the supply of coupons is limited.¹¹

To find out more about DTV, visit <http://www.hearusnow.org/>
You can obtain converter-box coupons at <https://www.dtv2009.gov/>¹²

What Will Happen to Hazardous “TV-Waste?”

Current estimates predict that one in four households will recycle at least one television as a result of the switch to DTV.¹³ Many people who get rid of their old TVs or computers don't think much about what happens to them. However, even those who believe they are recycling their old products safely may be contributing to the problem, because only a very small percentage of e-waste is handled responsibly.

Although e-waste makes up less than 4 percent of the total solid waste stream in the U.S., it is growing two-to-three times faster than any other type of waste.¹⁴ According to the EPA, in 2005 more than 2 million tons of e-waste was generated in the U.S., but only 17 to 18 percent of that was collected for recycling. The remainder—more than 80 percent—was disposed of, largely in local landfills.¹⁵ The hazardous materials in e-waste can leach out of the landfills into groundwater and streams, and if the plastic components are burned, dioxins are emitted into the air. As of March 2008, at least ten states had passed laws banning disposal of some electronics in landfills.¹⁶

E-Waste Is Exported for Recycling in Developing Nations

It is estimated that 50 to 80 percent of the e-waste collected for recycling in the U.S. is actually exported to developing countries,¹⁷ even though it is illegal for most of those countries to accept this toxic waste stream from the U.S. (see below). Much of this illegally traded waste is going to the informal recycling sectors in many Asian and West African countries, where it is dismantled or disposed of using very primitive and toxic technologies.¹⁸ Mountains of unwanted electronics containing mercury, beryllium, lead, brominated flame retardants, and many other toxins are openly burned, creating additional toxic substances such as halogenated dioxins and furans. Circuit boards are soaked in acid baths, with the spent acid full of heavy metals dumped directly in the rivers. Leaded CRT glass is dumped in former irrigation ditches after the valuable copper is removed, leaving a legacy of brain-damaging lead for generations to come. Impoverished workers, including children, smash leaded glass tubes, breathe lead solder fumes, and melt toxic plastic materials without proper protection or equipment for as little as \$1.50 per day.¹⁹

The California Department of Toxic Substances reports that in 2006 nearly 20 million pounds of e-waste was exported out of this state alone to countries that included China, India, South Korea, Nigeria, Malaysia, Mexico, Vietnam and Brazil.²⁰ According to *Science Daily*, China receives the bulk (70 percent) of the world's electronic waste intended for recycling.²¹

Why is this allowed to take place?

Massive amounts of toxic electronic waste leave the U.S. every day because:

- The U.S. has few regulations for this waste stream.

- The U.S. has not joined 170 other nations in ratifying the Basel Convention, an international treaty designed to stop free trade in hazardous wastes.
- It is far more lucrative for companies to sell this toxic waste to developing countries than to pay for responsible recycling in the U.S. or other developed countries.

What type of impact does this have?

In just one study, blood samples from dismantlers in Guiyu, China (the largest center for e-waste dismantling in China) showed record high levels of the PBDE flame retardant BDE-209—50 to 200 times higher than previously reported. Workers there rarely or never use masks or gloves; dismantling is done in enclosed areas with no roofs; and unusable materials are burned in the open air. Toxicology studies have shown that BDE-209 can impact thyroid hormones and alter brain development.²²

In addition, e-waste recycling can have a devastating impact on the environment of the communities where it is processed, with massive amounts of toxic waste remaining after the removal of valuable materials. Many of the toxins in electronic waste are persistent chemicals (such as heavy metals and dioxin) that remain in the environment and continue to accumulate. A 2005 report from the Basel Action Network (BAN) found that of an estimated 500 40-foot containers of used electronics shipped to Lagos, Nigeria, each month (supposedly for reuse), as much as 75 percent was unusable “junk.” That waste ended up being dumped and often openly burned in local landfills, creating dioxins and furans, some of the most toxic substances known to humankind.²³

The U.S. and the Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, a United Nations treaty (www.basel.int), was implemented in 1992 with the aim to “protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes.”²⁴ This international treaty is designed to be a formal trade barrier for hazardous wastes. As of October 2007, the Basel Convention had been ratified by 170 countries, with the U.S., Haiti, and Afghanistan remaining the only nations not to do so.

Although the treaty’s original purpose was to completely ban the trade in toxic wastes from developed to developing countries, the U.S. succeeded in gutting it of that purpose at the last minute, making it illegal only to ship toxic waste to Antarctica. Instead, the Basel Convention requires a formal written consent process between governments that wish to trade in toxic wastes (as defined under the Convention). However, because the U.S. has not ratified the treaty, U.S. law does not require such consent agreements, even if they are required by law in the importing country.

When the Convention was gutted of its original purpose, many less-developed nations, with the help of environmental groups, walked out in protest. They returned to pass a

consensus amendment to the Basel Convention in 1995, called the Basel Ban Amendment. The Basel Ban Amendment forbids developed countries from sending their toxic waste to developing countries for any reason.²⁵

Although this outright ban on export to developing countries is not yet in full legal force globally, most of the 65 nations that have ratified the Ban Amendment have already implemented it in their domestic laws, including all 27 European nations.²⁶ Again, because the U.S. has not ratified the treaty or the Ban Amendment, businesses in this country can legally export toxic e-waste, often in violation of laws in the importing countries.

E-Waste Is Recycled by U.S. Prison Labor

Increasingly, U.S. e-waste is being sent to prisons in this country for recycling in factories run by UNICOR (or the “Federal Prison Industries”). There, prison inmates, guards, and other employees are exposed to many hazardous chemicals, including lead and mercury. According to the group Public Employees for Environmental Responsibility, “Federal health officials found staff and inmates are being exposed to concentrations of lead and cadmium far above permissible limits in a prison industry computer-recycling plant located in eastern Ohio.”²⁷

Prison recycling workers report increased health problems, including “sinus problems, scratchy throats, headaches, unexplained fatigue, and burning skin, eyes, noses and throats.”²⁸ Other inmates have complained that they are supplied with inadequate and unsafe equipment.²⁹

Fear over retaliation, harassment, and intimidation prevents inmates from voicing concerns regarding worker safety, and government monitoring agencies, such as OSHA (Occupational Safety and Health Administration) are unable to make true surprise visits to federal prisons.

The nation’s largest small-business advocacy group, the National Federation of Independent Businesses (NFIB), opposes the use of prison labor, as does the AFL-CIO and the U.S. Manufacturers Association.³⁰ The U.S. Chamber of Commerce, the world’s largest federation of business organization (representing more than three million businesses and professional organizations) said:

“It is ironic that there are laws prohibiting the U.S. from importing goods that are made by prisoners in other countries, yet we have laws that require our own federal government to buy goods and services from prisoners in this country.”³¹

Impact of Toxic Materials on Electronics Manufacturing Workers

The huge influx of new TVs resulting from the switch to DTV will also have an impact on the workers who manufacture and assemble these products. According to the U.S. Bureau of Labor Statistics, in 2001 the rate of occupational illness for electronics industry workers was higher (9.5 percent) than the rate for the manufacturing industry as a whole (6.3 percent).³²

The majority of television manufacturing once took place in the U.S., but since the mid-1960s virtually all TV manufacturing has moved to other countries.³³ With over 13 million televisions manufactured in Tijuana, Mexico, in 2005 Tijuana was dubbed the “Television Capital of the World,”³⁴ and China is now rapidly emerging as the world’s leading TV manufacturer.³⁵

In 2002, a group of Taiwanese workers from RCA spoke out about the more than 1,000 former employees who were suffering from cancer, resulting in over 200 deaths. The facility made TVs and semiconductors. According to the Taiwan Association for Victims of Occupational Injuries and the Self-Help Association of Former RCA Employees, the RCA plant in the county of Taoyuan, Taiwan had indeed polluted groundwater with toxic chemicals.³⁶ In a study published in 2007, researchers found that “there was a significantly increased risk of breast cancer amongst female workers within this factory.”³⁷

A study of Mexican electronics workers found that nearly 60 percent “reported inadequate or no safety training on handling extremely toxic chemicals used in the TV industry [and] 38.8 percent reported that no safety equipment was provided.”³⁸

What You Can Do

Before you toss out your electronic products, including your analog TV, first ask yourself:

- Can I upgrade? In the case of analog TV components, you can use a converter box.
- If it still works, where can I donate it so it will be used?
- If it does not work, where can I find a responsible recycler? (See the link below for information on how to find an e-Steward recycler.)

Consumer advocacy makes a difference!

- Encourage manufacturers to take back their products and recycle responsibly. Thanks to consumer pressure, in 2007 Sony became the first major U.S. TV maker to commit to take back all its products. It is also the first company to sign the Electronics TakeBack Coalition's new "Manufacturers Commitment to Responsible E-Waste Recycling," pledging no dumping of toxic e-waste on developing countries; no use of prison labor in electronics recycling; and no disposal of toxic e-waste in landfills or incinerators.³⁹
- Use only e-Stewards (recyclers) who have qualified for the environmental community’s program for globally responsible recycling:
www.ban.org/pledge1.html
- Encourage the U.S. to stop exporting hazardous electronic waste to other countries.

- Encourage the U.S. to end all use of prison labor and create responsible recycling jobs in the U.S.
- Encourage electronics companies to work towards elimination of toxic materials in their products.

To find you how you can make a difference, visit *www.svtc.org* and click the Tune In link. You can also visit the Electronics TakeBack Coalition's "Take Back My TV" website at <http://takebackmytv.com/page/speakout/TakeBackMyTV>.

We invite you to contact SVTC to find out about other ways you can get involved.

Thanks to the Environmental Health Coalition and to our Electronics TakeBack Coalition partners the Basel Action Network and Clean Production Action for their assistance.

Summary of Toxic Materials in Electronics Products

SOURCE: U.S. Environmental Protection Agency (EPA)⁴⁰

Electronic equipment contains metals and other materials that can be hazardous to human health and the environment if they are not properly managed. The materials include:

Cadmium—*found in chip resistors, infrared detectors, and semiconductors.*

Cadmium can accumulate in, and negatively impact, the kidneys. Cadmium is persistent, bioaccumulative, and toxic. The principal exposure pathway is through respiration and through food.

Lead—*found in glass panels in computer monitors and lead soldering of printed circuit boards.*

Lead can cause damage to the central and peripheral nervous systems, blood systems, and kidneys in humans. Lead has also been shown to have negative effects on the development of children's brains. Lead can accumulate in the environment and have a detrimental effect on plants, animals, and humans. Consumer electronics may be responsible for 40 percent of the lead found in landfills. The principal pathway of concern is lead leaching from landfills and contaminating drinking water supplies.

Mercury—*found in thermostats, position sensors, relays and switches (e.g., on printed circuit boards), discharge lamps, and batteries. It is also used in medical equipment, data transmission, telecommunications, and mobile phones.*

When mercury makes its way into waterways, it is transformed into methylated mercury in the sediments. Methylated mercury can cause brain damage.

Hexavalent Chromium or Chromium VI—*used to protect against corrosion of untreated and galvanized steel plates.*

Chromium VI can damage DNA and has been linked to asthmatic bronchitis. The major pathways are through landfill leachate or fly ash generated when materials containing chromium VI are incinerated.

Brominated Flame Retardants (BFRs)—*found on printed circuit boards, components such as plastic covers, and cables, as well as in plastic covers of televisions.*

Although less is known about BFRs than some other contaminants of concern, research has shown that one of these flame retardants, polybrominated diphenylethers (PDBE) might act as an endocrine disrupter. Flame retardant polybrominated biphenyls (PBB) may increase cancer risk to the digestive and lymph systems. Once released into the environment through landfill leaching and incineration, they are concentrated in the food chain.

Plastics—Because manufacturers use many different types of plastic in electronic equipment, it is very challenging to recycle. These plastics often include contaminants such as metal screws and inserts, coatings and paints, foams, and labels. Currently, plastics from electronic equipment are both difficult and costly to sort for single resin markets, and there are limited markets for the mixed plastics stream. Also, plastics can be treated with brominated flame retardants, making them harder to recycle and possibly dangerous to those exposed to them.

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