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September 11, 2013

Chairwoman Anne M. Gobi  
Joint Committee on Environment, Natural Resources and Agriculture  
State House, Room 473F  
Boston, MA 02133

Chairman Marc R. Pacheco  
Joint Committee on Environment, Natural Resources and Agriculture  
State House, Room 312-B  
Boston, MA 02133

**Re: H.803 (Rep. Smizik); S.357 (Sen. Eldridge); S.386 (Sen. Pacheco), Re: Bills concerning the Collection, Reuse and Recycling of Discarded Electronic Products**

Dear Chairwoman Gobi and Chairman Pacheco, and Honorable Members of the Committee,

Thank you for providing this opportunity to offer our comments on the above mentioned bills. The Sierra Club wishes to express its strong support for establishing laws that govern the collection, reuse and recycling of discarded electronic products. This testimony refers to Re: H.803 (Rep. Smizik); S.357 (Sen. Eldridge); S.386 (Sen. Pacheco). In addition, I have included an addendum that specifically addresses S.386 as exec'ed as "ought to pass" by the Joint Committee on Environment, Natural Resources and Agriculture.

The Sierra Club is the oldest and largest non-profit, non-partisan environmental organization in the country. With over a forty year history in this chapter, the Massachusetts Sierra Club represents roughly 22,000 members throughout the state and over 1 million members and supporters nationwide. We fight for clean air, clean water, the preservation of the Commonwealth's most precious natural spaces, and healthy, vibrant communities.

As Americans, we produce more waste per capita than any country in the world. Our waste may contain plastics, acids, heavy metals, toxic compounds, and petroleum byproducts. Though many Massachusetts municipalities have designated drop-off days for materials such as used batteries, fluorescent lights, and microwaves, not enough people take advantage of these services, and instead place these items in their household trash. Massachusetts alone spends millions per year trying, often in vein, to keep toxic waste out of its landfills and incinerators. On a national level, it is estimated that of the 2.25 million tons of electronics waste ready for end-of-life (EOL) management, 18% was collected for recycling and 82% was disposed of, primarily in landfills.<sup>1</sup>

In an effort to avoid additional contamination of our environment and to conserve both raw materials and energy, the Sierra Club strongly supports the adoption of strong legislation that can properly deal with the problems posed by E-Waste, and urges the members of this committee to act favorably on this legislation. Implementation of strong legislation offers significant environmental benefits: increased recycling, energy conservation, raw materials conservation, diversion of toxins from improper disposal and reduction of greenhouse gas emissions. We would reap significant environmental benefits by diverting surplus electronic materials from landfills.

## What is electronic waste, and why is it a problem?

Electrical and electronic waste is defined by the Organization for Economic Co-operation and Development as “any appliance using an electrical supply that has reached its end-of-life.”<sup>2</sup> E-waste, as it is also called, includes household appliances, personal computers, televisions, and numerous other consumer products.

Accelerating technological advances, rapid growth in demand, and planned obsolescence have allowed these products to be rapidly produced at lower prices, enabling increased consumption of electronic products nationally. For example, although personal computers only make up a fraction of all e-waste, they are especially subject to rapid obsolescence due to technological improvements that cause companies to market new and improved models every few months. In 2010, the United States alone disposed of 30 million computers<sup>3</sup> and this quantity is expected to increase.<sup>4</sup> As a result of increased production and decreased life spans, electronic waste is one of the fastest growing components of the waste stream.<sup>5</sup>

The toxic components in e-waste makes the landfill and incinerator disposal of these products particularly problematic. E-waste contains metals such as cadmium, lead, mercury, arsenic, and brominated flame retardants that can pollute groundwater if disposed in a leaking landfill. The incineration of e-waste releases some of these heavy metals into the atmosphere while the remainder of these metals is sent to landfills as a component of incinerator ash. In landfills, these metals can produce contaminated leachate. Leachate is a liquid that forms in landfills from waste that can percolate through the soil carrying substances from the waste and has the potential to contaminate soil and water bodies. The majority of electronic devices tested create leachate that exceeds the *Resource Conservation and Recovery Act* limit of five milligrams per liter of lead. Leachate with lead concentrations above the threshold is considered hazardous waste.<sup>6</sup>

However, since the *Resource Conservation and Recovery Act* includes an exemption for household hazardous waste, e-waste from households and small businesses remains unregulated at the federal level. The lack of national legislation has encouraged the development of state and local policies to address the e-waste problem. Though there are many approaches to dealing with e-waste, one concept gaining significant traction is extended producer responsibility (EPR). This model provides incentives for redesigning products to minimize environmental impacts by using environmentally-safer materials and by specifically designing products to be efficiently recycled or reused.

### Toxic materials in electronics waste include:

- Americium: smoke alarms (radioactive source).
- Mercury: fluorescent tubes (numerous applications), tilt switches (mechanical doorbells, thermostats).[36]<sup>7</sup>
- Sulfur: lead-acid batteries.
- PBBs: Predecessor of PCBs. Also used as flame retardant. Banned from 1973-1977 on.
- PCBs: prior to ban, almost all 1930s–1970s equipment, including capacitors, transformers, wiring insulation, paints, inks, and flexible sealants. Although banned from manufacturing during the 1980s, these compounds are still present in the waste stream.
- Cadmium: light-sensitive resistors, corrosion-resistant alloys for marine and aviation environments, nickel-cadmium batteries.
- Lead: solder, CRT monitor glass, lead-acid batteries, some formulations of PVC.<sup>8</sup> A typical 15-inch cathode ray tube may contain 1.5 pounds of lead,<sup>9</sup> but other CRTs have been estimated as having up to 8 pounds of lead.<sup>10</sup>
- Beryllium oxide: filler in some thermal interface materials such as thermal grease used on heatsinks for CPUs and power transistors,<sup>11</sup> magnetrons, X-ray-transparent ceramic windows, heat transfer fins in vacuum tubes, and gas lasers.
- Polyvinyl chloride: The third most widely produced plastic, containing additional chemicals to change the chemical consistency of the product. Some of these additional chemicals called additives can leach out of vinyl products. Plasticizers that must be

added to make PVC flexible have been additives of particular concern. Burning PVC in connection with humidity in the air creates hydrochloric acid (HCl).

Benefits of implementation of strong electronics waste legislation include:

**Reduction in Toxins:** Cathode Ray Tubes (TVs and computer monitors) contain 1.5 to 8 pounds of lead each and, although it is illegal to put in the trash, people still throw them out. The lead easily leaches into groundwater. Toxic emissions can be reduced by e-waste legislation in several ways: (1) by increasing recycling, (2) holding manufacturers responsible for discard management of their products, and (3) requiring recyclers to be certified by E-Stewards.<sup>12</sup>

**Increased Recycling:** The implementation of the amended bill would result in increased recycling and better diversion of needed materials from the waste stream. Recycling a ton of so-called "waste" has twice the economic impact of burying it in the ground and prevents the environmental pollution and liability issues associated with their disposal.

**Increased Energy Efficiency:** Recycling rather than disposal will result in significant energy savings from using recycled feedstocks as opposed to extracting virgin materials.

**Protection and Conservation of Resources:** This bill can protect the sensitive regions where resource extraction conflicts with other environmental priorities including protecting existing air and water quality or high-value biologic or aesthetic aspects.

**Increased Jobs:** Recycling creates about 8 times more jobs than disposal. Recycling has made a vital contribution to job creation and economic development. Recycling creates or expands businesses that collect, process, and broker recovered materials as well as companies that manufacture and distribute products made with recovered materials. Numerous studies have documented the billions of dollars invested and the thousands of jobs created by recycling. One such study documented that recycling activities support more than 8,800 jobs in the state of North Carolina, most of which are in the private sector<sup>13</sup>. The study also found that recycling was a net job creator - for every 100 jobs created by recycling only an estimated 13 were lost in solid waste collection and disposal and virgin material extraction within the state.<sup>14</sup> A 2010 study, conducted in the UK, showed similar job gains<sup>15</sup>.

**Level playing field.** This legislation will also create a level playing field for manufacturers. All will be held to the same performance standard, which will foster business and technical innovation.

Because this proposed legislation, with the changes noted in the addendum, would have a significant positive impact for the environment and ecosystems of the Commonwealth and beyond, the Sierra Club hopes to fully support the amended bill, and furthermore hopes that it is supported by all members of the Massachusetts Senate and House of Representatives.

The Sierra Club looks forward to supporting passage of an effective Electronics Waste bill. If the noted changes are made to S.386, it would be brought in line with the goals of producer responsibility bills, shifting the costs from local governments to producers and increasing reuse and recycling.

Respectfully,



Ryan Black  
Director  
Massachusetts Sierra Club

*Additional Information:*

*Facts and Figures on Ewaste, Electronics Take Back Coalition*

[http://www.electronicstakeback.com/wp-content/uploads/Facts\\_and\\_Figures\\_on\\_EWaste\\_and\\_Recycling.pdf](http://www.electronicstakeback.com/wp-content/uploads/Facts_and_Figures_on_EWaste_and_Recycling.pdf)

## **ADDENDUM: Requested changes to S.386**

While the Sierra Club supports legislation which would properly address the problem of increasing electronic waste, we believe that S.386 as reported out by the Joint Committee on Environment, Natural Resources and Agriculture, as well-intentioned as it might be, will have far less of a net effect than what's required by the magnitude of the waste problem. As a result, we respectfully request Senate Ways and Means to consider the proposed changes as noted below.

On March 26, 2013, An Act Relative to Information Technology Producer Responsibility, S.386 was reported favorably by the *Joint Committee on Environment, Natural Resources and Agriculture*. While the bill was well-intentioned, and does call attention to the growing problem of electronic waste, the net effect will be far less than what's required by the magnitude of the problem facing the Commonwealth.

The goals of producer responsibility bills are (1) to shift the burden of managing covered products from local governments to the producers who design and market the products, and (2) to increase the reuse and recycling of the covered products, thereby protecting the environment and also generating new businesses and jobs in the Commonwealth. In Massachusetts we have had a waste ban on cathode ray tubes for 13 years, and already have a well-developed municipal infrastructure for collecting electronics, and thus a higher recycling rate than most states, currently estimated to be at least 6 pounds per capita. Recent data from Vermont's 2-year-old E-Cycle collection program showed a collection rate of 7.7 lbs/capita in its last program year.<sup>16</sup> Our goal is to increase our current recycling rate while relieving our cash-strapped municipalities from the financial burden of recycling these products. Therefore a Massachusetts e-waste bill must at least maintain the level of recycling convenience we have now, and also ensure that electronics collected by our municipalities are covered year-round under the program that is established by the e-waste bill.

Bill S.386, which is based on establishing a statewide goal, could be an effective producer responsibility bill with only two key modifications, and a third to provide consistency with the other two; We therefore respectfully submit the following recommendations for consideration

**1. Eliminate the provision that counts material collected from municipal programs for recycling as double for the producer's target collection by weight, Section 3 (h).** If left unchanged, the "doubling" provision combined with the yearly downward adjustment in the statewide goal (after the first three years) based on *actual weight collected, as prescribed by the bill*, means that in three years the statewide rate could become 3 pounds per capita—not 6. And the following year the industry need only collect half of that—or 1.5 pounds. *Thus over time the statewide goal would be a vanishing number.* Note that "doubling" of material collected for reuse, however, is acceptable because such materials make up very small proportion of the waste stream, while the benefits from reuse are much higher than from recycling.

**2. Require producers to accept covered electronics into their programs on an ongoing, year-round basis from any public or private entity providing electronics collection service as of December 31, 2012, Section 3 (c) 1.** As noted, an effective producer responsibility bill for electronics must at least maintain the current rate of recycling, which is currently estimated to be higher than 6 lbs./capita, while also ensuring that municipalities accepting electronics from residents are not left with the cost of recycling this material. In Massachusetts, this is essential because for many years our municipalities have been forbidden by regulation to send CRTs to disposal facilities, and have had to bear the cost or charge a fee to cover all or part of the cost of recycling computers and TVs. Without this additional provision, there is nothing in the bill to ensure that the material brought to municipal programs will be accepted by the program after manufacturers reach their collection goals for a given year, and, as noted, shifting the costs of recycling electronics

from municipalities to the producers is the first goal of a producer responsibility bill for electronics.

**3. Consistent with #2 above, the “Manufacturer’s Collection Amount” should be defined as the *minimum* weight in covered electronic equipment that has reached the end of its useful life that each manufacturer is responsible for collecting annually, as measured by the product of the statewide collection goal and the manufacturer’s market share, Section 1, “Manufacturer’s Collection Amount.”** Currently the bill defines the manufacturer’s collection amount as a *fixed* total, which would enable the manufacturers to shut off their program every year when they reach this target, instead of continuing to accept materials collected by municipalities year round. Therefore, as this practice works against the goals of increasing recycling and shifting the cost burden from municipalities, as stated above, the target collection amount should be expressed as a “minimum” rather than a fixed amount.

In an effort to avoid additional contamination of our environment and to conserve both raw materials and energy, the Sierra Club strongly supports the adoption of the changes to S.386 noted herein, and urges the members of this committee to act favorably on this legislation.

The Sierra Club would be pleased to be given the opportunity to discuss this further and answer any questions you might have. Thank you for your consideration of these suggested changes.

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<sup>1</sup> Recycling vs Disposal of E-Waste in the United States, Environmental Protection Agency, Statistics on the Management of Used and End-of-Life Electronics, 2007

<sup>2</sup> “Addressing Electronics Waste in New York City, An Extended Producer Responsibility Approach” Columbia University, Workshop in Applied Earth Systems Policy Analysis. May 2006.

[www.columbia.edu/cu/mpaenvironment/pages/projects/spring2006/electronic%20waste%20final%20report.pdf](http://www.columbia.edu/cu/mpaenvironment/pages/projects/spring2006/electronic%20waste%20final%20report.pdf)

<sup>3</sup> Statistics on the Management of Used and End-of-Life Electronics. US Environmental Protection Agency. Retrieved 2012-03-13.

<sup>4</sup> Hilty, Lorenz. “Electronic Waste- An Emerging Risk?” Environmental Impact Assessment Review. 25 (2005): 431-435.

<sup>5</sup> Environmental Protection Agency. Nov. 23 2005. E-cycling questions and answers. 4 Feb. 2006.

[www.epa.gov/epaoswer/hazwaste/recycle/ecycling/faq.htm](http://www.epa.gov/epaoswer/hazwaste/recycle/ecycling/faq.htm)

<sup>6</sup> Townsend, Timothy, Kevin Vann, Sarvesh Mutha, Brian Pearson, Yong-Chul Jang, Stephen Musson, and Aaron Jordan.. “RCRA Toxicity Characterization of E-waste.” (2004): 1-79. 4 Feb. 2006.

<<http://www.ees.ufl.edu/homepp/townsend/Research/ElectronicLeaching/UF%20EWaste%20TC%20Report%20July%2004%20v1.pdf>>

<sup>7</sup> Life-Cycle Assessment of Desktop Computer Displays, Question 8: Summary of Results, US Environmental Protection Agency. Oct 22, 2009

<sup>8</sup> The Collective Good (Recycling) <http://www.collectivegood.com/environmental.asp>.

<sup>9</sup> Morgan, Russell (2006-08-21). “Tips and Tricks for Recycling Old Computers”. SmartBiz. <http://www.smartbiz.com/article/articleprint/1525/-/1/58>. Retrieved 2009-03-17.

<sup>10</sup> Royte, Elizabeth (2005-08-01). “E-gad! Americans discard more than 100 million computers, cellphones and other electronic devices each year. As “e-waste” piles up, so does concern about this growing threat to the environment.”. Smithsonian Magazine (Smithsonian Institution). [http://www.accessmylibrary.com/coms2/summary\\_0286-9604019\\_ITM](http://www.accessmylibrary.com/coms2/summary_0286-9604019_ITM). Retrieved 2009-03-17.

<sup>11</sup> Becker, Greg; Lee, Chris; Lin, Zuchen (July 2005). “Thermal conductivity in advanced chips: Emerging generation of thermal greases offers advantages”. Advanced Packaging: 2–4. <http://www.apmag.com/>. Retrieved 2008-03-04.

<sup>12</sup> e-Stewards Certification is an emerging global program designed to enable individuals and organizations who dispose of their old electronic equipment to easily identify recyclers that adhere to the highest standard of environmental responsibility and worker protection. e-Stewards Certification is open to electronics recyclers, refurbishers and processors. See [www.e-stewards.org](http://www.e-stewards.org)

<sup>13</sup> The Impact of Recycling on Jobs in North Carolina, NC Office of Waste Reduction, Department of Environment, Health, and Natural Resources, Report July 1995.

<sup>14</sup> U.S. Environmental Protection, Puzzled About Recycling’s Value? Look Beyond the Bin, US EPA Agency Office of Solid Waste And Emergency Response, January 1998

<sup>15</sup> Increased recycling could create 50,000 jobs, report finds. The Guardian (UK), Sept 14, 2010.

<sup>16</sup> Full of Scrap, newsletter, Northeast Resource Recovery Association, May 15, 2013 [www.nrra.net/news/newsfull-of-scrap/full-of-scrap-05152013/](http://www.nrra.net/news/newsfull-of-scrap/full-of-scrap-05152013/)