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Avoiding the Creation of an E-Wasteland

Electronic devices have become increasingly popular in the past few decades, in the form of desktop computers, laptops, tablets, cell phones, personal music players among others. The urge to upgrade is near unavoidable as those devices get older and newer, more featured versions of those devices become available. After replacement, the question remains of how to dispose of the unwanted devices. Since electronics contain a variety of rare, sometimes toxic materials, just throwing them into the trash may not be the best idea. As the bulk of waste thrown into trash bins and dumpsters ends up in landfills, the responsible thing to do would be to ask how e-waste, or “electronic equipment that has reached its end of life in the hands of its current user”, may affect the environment (“E-waste Facts”). The sheer volume of e-waste being generated per year across the world mandates that measures be taken to safely, effectively deal with these electronic discards. As with all forms of recycling, taking responsibility for this kind of waste begins with the consumer.

Although some e-waste recycling programs are currently in place, the average consumer may be unaware of them. The authors of University of Arkansas’ “E-Waste Facts” argue that in 2007, up to 85% of e-waste ended up in landfills. Additionally, the EPA reports that in 2009, 38% of computers, 17% of televisions, and a mere 8% of cell phones that were disposed of were

recycled (“Frequently Asked Questions”). To further put those numbers into perspective, the EPA reports that as of 2009 the amount of e-waste in the waste stream totaled some 2.37 million short tons (“Frequently Asked Questions”). However, despite the fact that e-waste contains many toxic chemicals, it also contains a variety of valuable materials. According to Clancy, every one million cell phones contain 75 pounds of gold, 772 pounds of silver, 33 pounds of palladium, and 35,000 pounds of copper. As the Earth contains a finite amount of these rare elements, there will eventually come a time that recycling is the only method of obtaining these elements.

Developing methods to recapture the rare materials used in electronics now, before the resources are depleted, would not only keep those rare materials usable, but also prevent having to develop those same methods later on a much shorter time schedule. When all of these factors are considered together, it is easily seen that e-waste disposal is not an issue that should be ignored or taken lightly.

Although recycling is, by far, one of the best methods of keeping the environment free of harmful pollutants, as well as preserving natural resources, there are those that are apathetic to how e-waste is handled, as they are too busy to take the time to recycle. State and local e-waste recycling programs are also rare, which may leave even those willing to recycle unsure of how to dispose of their unwanted electronics. As Ming discovered, experts assume that the majority of e-waste is disposed of in landfills, incinerated, exported, or abandoned in storage (1). Even the EPA feels that properly managed landfills containing e-waste do not threaten human health or the environment (“Frequently Asked Questions”). There also may be an amount of worry regarding security of personal information stored on electronic devices getting into the wrong hands if it were turned in for recycling, as obviously someone else is going to be handling it.

Clearly, even though recycling may be one of the best options, there are reasons proper disposal steps may not be taken.

However, the release of hazardous materials into the environment due to disposal of e-waste into a landfill could be significant (Ikonomou 471). This is alarming, as although e-waste comprises only 2% of the waste in landfills, it accounts for 70% of the toxic waste (“E-Waste Facts”). This could lead to the contamination of the areas surrounding those landfills. Studies have shown that many of the plastics used in electronics contain polybrominated diphenyl ethers (PBDEs), which have been linked to disruption of thyroid hormones, as well as causing neurobehavioral deficits and cancer (Snedeker). Scientific experimentation conducted by Ikonomou shows that disposal of e-waste into landfills could lead to PBDEs being leached into the environment, with the majority of the leaching occurring in the first twenty four hours (470). Electronics also contain relatively high amounts of rare materials. Recycling them would preserve those materials, reducing the amount of mining, processing, and manufacturing to produce new resources. Furthermore, a recent poll reported in Saphores’ work shows that only one third of the people polled have recycled e-waste, but three quarters are willing to do so (61). This would strongly suggest that recycling programs need to be advertised and accessible to the general population for them to be effective.

The problem of e-waste is not limited to the United States or industrialized European countries. Ming reports that testing at an e-waste site in Guiyu, China, showed persistent pollutants in the air, soil, and surrounding area including lead, cadmium, nickel, chromium, mercury, arsenic, PBDEs, as well as the organic pollutants (1). The same author also mentions that at that plant, the recycling methods used were burning wire piles or using acid baths to extract metals, melting or chopping plastics, and burning circuit boards over grills to release

chips and precious metals (Ming 1). These crude methods of recycling could be the source of the hazardous chemicals found in the immediate environment. As such, the stewardship of generated e-waste should not be handed over to less developed countries with less strict regulations regarding the handling of hazardous materials. This may be a cheaper option to proper recycling methods that use methods to prevent environmental contamination, but obviously it is not a good way to handle any type of waste that contains hazardous chemicals. Additionally, even though this problem may exist in a different country, there is no way to limit environmental contamination to a local scale. Locally managed e-waste recycling programs are likely to present a more workable, practical solution.

Drop off locations for used cell phones are readily available and easily found, some only as far away as the nearest Wal-mart. In order to prepare cell phones for recycling, users should remove all personal information from the cell phone. Most cell phones have a factory reset option located in the settings menu which would accomplish this task. If a user has a computer that is no longer being used, or is broken, check to see if the manufacturer has a recycling program. Hewlett Packard, Dell, Apple, and Gateway all have recycling programs in place for computers they have manufactured that typically involves a drop off location at a certified repair facility. If there is no program available from the manufacturer, or if it is more convenient, Best Buy has a drop off e-waste recycling program for all types of computers. If lugging a computer tower to a recycling center is a hardship, or if there are no convenient locations for disposing of e-waste, contacting local government representatives may be a viable option. Let them know you support the institution of a community e-waste recycling program may motivate lawmakers to institute methods of dealing with e-waste on a local level.

Obviously, e-waste is not a transient problem, nor is it one that should be ignored and allowed to get out of control. As e-waste contains materials that could be hazardous to human life and the environment, proper disposal of old electronics should be undertaken wherever it is most practical and safe to do so. Hazardous chemicals such as PBDEs can readily contaminate groundwater through leaching. There are also other toxic substances as well as heavy metals that need to be either recycled or otherwise prevented from being released into the environment. The rare elements used in electronics shouldn't be left to decay in landfills, they should be preserved by recycling. The harvesting of reusable elements has the added benefit of negating the need to mine or manufacture more of these rare materials. If we wish to preserve the environment as well as our rare natural resources for the following generations, we need to be proactive in the disposal of electronics. Convincing local governments to institute recycling programs would make disposal much easier, as drop off locations could be officially established for all types of e-waste. Educating the public as to where and how to dispose of their old electronics may help, but the most important thing is to make proper disposal easy. If something is easily done properly, people are less likely to take shortcuts. Recycling may not be the simplest option, as thought needs to be put into determining what needs to be recycled and what does not, but the lifespan of modern electronics is becoming shorter and shorter as new devices with expanded features become available. Leaving mountains of outdated or broken electronics to decay in landfills across the world is simply irresponsible behavior. (WC: 1483)

Works Cited

- Clancy, Heather. "Fun facts about recycled plastics, e-waste." *Green Blog*. Zdnet, 16 Nov. 2010. Web. 28 Apr. 2013. <http://www.zdnet.com/blog/green/fun-facts-about-recycled-plastics-e-waste/15017>
- "E-waste facts." *Information Technology Services: eCycle*. University of Arkansas. n.d. Web 28 Apr. 2013. http://ecycle.uark.edu/ewaste_facts.php
- "Frequently Asked Questions on E-Waste." *Environmental Protection Agency*. n.d. Web. 28 Apr. 2013. <http://www.epa.gov/epawaste/consERVE/materials/ecycling/faq.htm>
- Ikonomou Michael, et al. "Transfer Of Pbdes From E-Waste To Aqueous Media." *Science Of The Total Environment* (n.d.): *ScienceDirect*. Web. 28 Apr. 2013
- Ming, Man, Naidu Ravi, and Wong Ming H. "Persistent Toxic Substances Released From Uncontrolled E-Waste Recycling And Actions For The Future." *Science Of The Total Environment* (n.d.): *ScienceDirect*. Web. 28 Apr. 2013.
- Saphores Jean-Daniel M., Ogunseitan Oladele A., and Shapiro Andrew A. "Willingness To Engage In A Pro-Environmental Behavior: An Analysis Of E-Waste Recycling Based On A National Survey Of U.S. Households." *Resources, Conservation & Recycling* 60.(n.d.): 49-63. *ScienceDirect*. Web. 28 Apr. 2013.
- Snedeker Suzanne M. "PBDEs" *Breast Cancer and Environmental Risk Factors*. Cornell University. Web. 28 Apr. 2013 <http://envirocancer.cornell.edu/pbde/brief.pdf>