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E–Waste Management

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Abstract-- e-waste is actually the old electronic goods that people simply give away to garbage trucks that are then dumped into landfill or similar sites. Electronics have a number of harmful elements that react with air and water to create problems of e-waste such as water, air and soil pollution as well as problems that affect human beings in the form of diseases.

Keywords: Effects, Environmental Impact, Processing Techniques

INTRODUCTION

We used old cells and batteries as an example. Most of the cheaper batteries are lead based and easily react with water (rain or moisture) to seep and mix with underground water along with polluting the soil and air where it was disposed by the garbage department. Thus, everything that falls into electronics' category, that you intend to throw away, is e-waste (electronic waste). This includes computers, laptops, tablets, smart phones and so on. There are proper methods to dispose of electronic items. They should be handled differently, but unfortunately, even the developed countries do not have strong policies to take care of such harmful, toxic garbage.

EFFECTS OF E-WASTE

The solder present on the motherboard of computers and TV contain high levels of lead. Even the glass panels of computer monitors and of course, the lead batteries contaminate air, water, and soil. In addition, they distort the process of brain development, while posing danger to central nervous system and kidneys. This (lead poisoning) is among the most dangerous hazards of e-waste. Other than lead, motherboards also have high levels of Mercury. Improper disposal may create skin and respiratory disorders. Mercury poisoning also causes acute brain damages. The cables and PVC panels as well as glass, when reacts with moisture and oxygen, creates hazardous soil that may not be suitable for even building a home as the people breathing that air will suffer from reproduction and proper development of body parts, including the brain. It also spoils the immune system. Stress, anxiety, and other mental problems can arise out of breathing air polluted with glass, PVC and other forms of plastic remains found in electronic items. The motherboard circuits can cause lung cancer when you breathe air polluted by the fumes released when the motherboard elements react and create Beryllium. It is also responsible for skin diseases, including warts and certain forms of dangerous allergies.

TREATING E-WASTE

There are no proper methods being implemented even in the first world to eliminate the problem of e-waste. The two methods I found interesting for proper treatment of e-waste are recycling and refurbishing. For recycling, there may be products that cannot be recycled completely. PVC layers, for example, stay as such for ages and cannot be recycled. It would be better if the manufacturers use recyclable material so that the e-waste is converted into something that can be used again without harming the planet and its inhabitants. Thus, one of the major factors in treating e-waste is to compel manufacturers to use green elements. If electronics are refurbished, they can be sold again at a lower price. Thus, both the society and environment will benefit. Instead of simply dumping your old TV into the garbage bin, you might want to think about calling the vendor and ask him where to present the item for refurbishing. If you cannot find, consider donating the item to some charity that can either use it as such or get it repaired and use it.

MINIMIZING E-WASTE IS IMPORTANT:

The manufacturing of the devices and the use of rare materials that go into their production represent a huge source of embodied energy. Minimizing e-waste helps to conserve resources and reduces the amount of energy we take from the earth.

- Re-evaluate. Try finding one device with multiple functions.
- Extend the life of your electronics. Buy a case, keep your device clean, and avoid overcharging the battery.
- Buy environmentally friendly electronics. Look for products labeled Energy Star or certified by the Electronic Product Environmental Assessment Tool (EPEAT).

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- Donate used electronics to social programs—and help victims of domestic violence, children safety initiatives, environmental causes, and more. Ask your student REP for a postage paid mailer for your cell phone or ink cartridge. For each item received, the World Wildlife Fund will receive one dollar.
- Reuse large electronics.
- Recycle electronics and batteries in e-waste recycling bins located around campus. Large electronics can go in the larger bins found in your building.

ENVIRONMENTAL IMPACT:

The processes of dismantling and disposing of electronic waste in developing countries lead to a number of environmental impacts as illustrated in the graphic. Liquid and atmospheric releases end up in bodies of water, groundwater, soil, and air and therefore in land and sea animals – both domesticated and wild, in crops eaten by both animals and human, and in drinking water.

- Airborne dioxins – one type found at 100 times levels previously measured
- Levels of carcinogens in duck ponds and rice paddies exceeded international standards for agricultural areas and cadmium, copper, nickel, and lead levels in rice paddies were above international standards
- Heavy metals found in road dust – lead over 300 times that of a control village's road dust and copper over 100 times

INFORMATION SECURITY:

E-waste presents a potential security threat to individuals and exporting countries. Hard drives that are not properly erased before the computer is disposed of can be reopened, exposing sensitive information. Credit card numbers, private financial data, account information, and records of online transactions can be accessed by most willing individuals. Organized criminals in Ghana commonly search the drives for information to use in local scams. Electronic files about government contracts have been discovered on hard drives found in Agbogbloshie .Multimillion-dollar agreements from United States security institutions such as the Defense Intelligence Agency (DIA), the Transportation Security Administration and Homeland Security have all resurfaced in Agbogbloshie.

PROCESSING TECHNIQUES:

In many developed countries, electronic waste processing usually first involves dismantling the equipment into various parts (metal frames, power supplies, circuit boards, plastics), often by hand, but increasingly by automated shredding equipment. A typical example is the NADIN electronic waste processing plant in Novi Iskar, Bulgaria—the largest facility of its kind in Eastern Europe. The advantages of this process are the human's ability to recognize and save working and repairable parts, including chips, transistors, RAM, etc. The disadvantage is that the labor is cheapest in countries with the lowest health and safety standards.

In an alternative bulk system, a hopper conveys material for shredding into an unsophisticated mechanical separator, with screening and granulating machines to separate constituent metal and plastic fractions, which are sold to smelters or plastics recyclers. Such recycling machinery is enclosed and employs a dust collection system. Some of the emissions are caught by scrubbers and screens. Magnets, eddy currents, and Trommel screens are employed to separate glass, plastic, and ferrous and nonferrous metals, which can then be further separated at a smelter.

Leaded glass from CRTs is reused in car batteries, ammunition, and lead wheel weights, or sold to foundries as a fluxing agent in processing raw lead ore. Copper, gold, palladium, silver and tin are valuable metals sold to smelters for recycling. Hazardous smoke and gases are captured, contained and treated to mitigate environmental threat. These methods allow for safe reclamation of all valuable computer construction materials. Once your disk drive is shredded into pieces about this big, it's hard to get the data off. An ideal electronic waste recycling plant combines dismantling for component recovery with increased cost-effective processing of bulk electronic waste. Reuse is an alternative option to recycling because it extends the lifespan of a device. Devices still need eventual recycling, but by allowing others to purchase used electronics, recycling can be postponed and value gained from device use.

CONCLUSION:

There are currently very few regulations on the disposal of E-Waste and they are being allowed to enter our landfills or be burned. We are willingly allowing hazardous substances to leach into our water and air so that we may enjoy a new form of technology. This problem is not going to go away because the global population is growing and the demand for newer and better technology is creating enormous amounts of old and outdated electronics.

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