

# WM07

## E-Waste and its Management – A Global Perspective

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*“When we poison our environment, we poison our bodies, because our bodies are this environment, taken in as foods, water and air. Environmental pollution becomes internal pollution.” Udo Erasmus*

**Abstract— In this paper, we intend to draw attention on the growing e-waste problem worldwide and how best it could be managed by means of proper recycling/reusing or adapting to other methodology. We also intend to give some examples of countries like Switzerland as to how effectively and environment friendly they are managing their e-waste and what we can learn from them to protect the environment.**

### INTRODUCTION

By electronic waste also known as e-waste is meant used electronic devices such as mobile phones, computers, televisions, etc., that have been thrown away [1]. E-waste is already a growing problem in the western world and it is also creeping in countries with low resource setting (LRS) or the developing countries like Bangladesh.

Computers and related hardware and other electronic devices may have a life time for about 3-5 years. After that time these older equipments need to be replaced with newer set of equipment. The big question that arises is how to get rid of the older equipment, which are not biodegradable. Moreover, there are many harmful toxic materials in cell phones and other electronic devices such as lead, arsenic, and beryllium. Each CRT (Cathode Ray Tube) can contain up to 5 pounds of lead. They also contain barium oxide which is harmful to the lungs. All these harmful, toxic and non-biodegradable materials in the e-waste have a long lasting consequence on our health and environment [2], [3].

The Environmental Protection Agency (EPA) in the U.S estimates that every year Americans “retire” 130 million cell phones, printers, copiers, keyboards, mice, VCR’s, scanners, and digital cameras. EPA also estimates that every year over two million tons of this same sort of scrap are dumped on the landscape. Discarded e-scrap makes up over 70% of heavy metal waste in U.S landfills. While all this is daunting, consider that over 80% of “recycled” electronics in the U.S is shipped abroad to less wealthy countries [4]-[6].

In this paper we intend to present the rapidly growing e-waste problem worldwide and how best it could be managed by means of proper recycling/reusing or adapting to other methodology. We also intend to give some examples of countries like Switzerland as to how effectively and environment friendly they are managing their e-waste and what we can learn from them to protect the environment.

### E-WASTE RECYCLING

Recycling and reusing e-waste may sound like an acceptable option. However, e-waste contains toxic elements from a(arsenic) to z(zinc). If not properly handled these elements might cause damage, especially in LRS countries with almost no environmental correctional facilities. The e-waste dumping is spreading rapidly and widely in Africa, Bangladesh, China, India, Indonesia, Korea and Vietnam. There are vast differences of electronics recycling the world over. In LRS countries, some people don’t even wear masks or gloves while burning circuit boards and plastic off of cables to get to metals of more values.

#### *Metals in Recycled Electronics*

The following metals of values can be found in recycled electronics [4], [6]:

- In each ton of cell phones:
  - Over 12 ounces of gold
  - 8 pounds of silver
  - 286 pounds of copper.
- In a single desktop pc:
  - Over 220 milligrams of gold.

Proper electronic recycling could be expensive and challenging. However, it could also be a profitable business opportunity for many countries.

### REGULATED E-WASTE RECYCLING

Switzerland implemented a federally regulated proper e-waste management program in 1991 and became the first in the world. 98% of electronics waste in Switzerland is recycled or incinerated to produce energy in clean-burning factories with scrubbers to prevent air pollution. Consumers also pay different fees at different times for their waste. They pay by the pound for normal waste, and an up-front charge is included with e-waste. When the useful life on one of these electronic items is reached, consumers simply drop off the unit at one of the recycling stations [4], [6]-[9].

### DISCUSSION

Pollution typically has no boundaries. E-waste and its proper management is a global issue. The Switzerland model for e-waste management seems to work to protect their environment and it should be adapted worldwide. This is a work in progress and we intend to present more findings in the fourth coming conference.

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