

## Electronic Waste and Its Management

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### Abstract

The electrical and electronic waste (e-waste) is one of the fastest growing waste in India. The increasing “market penetration” in developing countries, and “high obsolescence rate” make e-waste as one of the fastest growing waste streams. Central issue of the current study is electronic-waste (e-waste) which is emerging as a new environmental challenge for 21st century. Rapid growth of the electronic and IT industry, present consumer culture, increasing rates of consumption of electronic products have led to disastrous environmental consequence. Many legislation and regulation available in global and national level, but no legislation is governed in the informal sector. This paper is based on secondary data which study the e-waste composition, Global and Indian E-waste scenarios and different hazardous materials found in the E-waste, Best Available Practices to find the hazardous materials, Guideline for the manufacturer and public awareness about the proper disposal of e-waste.

**KEYWORDS:-**E- waste, electronic waste, reuse, recycling, environmental challenges, developing countries, India, recycle, reuse, e-waste management.

### 1. Introduction :-

The technical prowess acquired during the last century has posed a new challenge in the management of wastes. For example, personal computers (PCs) contain certain components, which are highly toxic, such as chlorinated and brominated substances, toxic gases, toxic metals, biologically active materials, acids, plastics and plastic additives. The hazardous contents of these materials pose an environmental and health threat. Thus proper management is necessary while disposing or recycling e-wastes. Examples of electronic waste include, but not limited to: TVs, computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, calculators, phones, answering machines, digital/video cameras, radios, VCRs, DVD players, MP3 and CD players, Kitchen equipment (toasters, coffee makers, microwave ovens), Laboratory equipment (hot plates, microscopes, calorimeters), Broken computer monitors, television tubes (CRTs). electricity/battery or has wire and completed its life is e-waste. Used electronics which are destined for reuse, resale, salvage, recycling or disposal are also considered e-waste.

Informal processing of e-waste in developing countries can lead to adverse human health effects and environmental pollution. Electronic waste, E-scrap, or Waste Electrical and Electronic Equipment (W.E.E.E) describes discarded electrical or electronic devices. There is a lack of consensus to whether the term should apply to resale, reuse, and refurbishing industries, or only to product that cannot be used for its intended purpose.

### 2. Objectives

- To review hazards of electronic waste.
- To study effect of growing consumerism on generation of e-waste.
- To highlight the issues related with reuse, recycle and disposal of e-waste.

- To study effect of e-waste on health and environment.
- To collect relevant review of literature.

### **3. Growing Consumerism:-**

The electrical and electronic waste (e-waste) is one of the fastest growing waste in India. The increasing “market penetration” in developing countries, and “high obsolescence rate” make e-waste as one of the fastest growing waste streams. Over the past two decades, the global market of electrical and electronic equipment (EEE) continues to grow exponentially, while the lifespan of those products becomes shorter and shorter. Therefore, business as well as waste management officials is facing a new challenge, and e-Waste or waste electrical and electronic equipment (WEEE) is receiving considerable amount of attention from policy makers. Predictably, the number of electrical devices will continue to increase on the global scale, and microprocessors will be used in ever-increasing numbers in daily objects.

### **4. Management Of E-waste :- (Reduce Reuse, Resale, Recycling & Disposal)**

#### **4.1. REDUCE**

Reducing the amount you buy is the most significant of all the options to manage waste. The key is to only purchase goods that we need and in the right amount. If we never generate products in the first place, we do not have to extract raw resources, manufacture goods from scratch, come up with shipping materials, utilize additional resources.

#### **4.2. Recycled:-**

Recycled items are put through a process that makes it possible to create new products out of the materials from the old ones. Once you've organized a collection with one of our sales team, the rest is up to us. The driver will arrive in the agreed two hour window and always call you on approach to make sure you're ready. We will also re-confirm the price of your collection before he begins to load the truck. (If you're not going to be home that's no problem, just let us know where you'll be leaving your electronic waste and we can organize payment over the phone. )Once we've loaded up the day's e-waste onto the truck, it's taken to a private recycling facility within Australia to be recycled. This is where it gets complicated...

Most electronic waste goes through a recycling system called a WEEE (Waste Electrical and Electronic Equipment), which not only recycles 95-98%, by weight, of all e-waste passed through it, but ensures that any data left on hard drives and memories are thoroughly destroyed too.

- Picking Shed – first all the items are sorted by hand and batteries and copper are extracted for quality control. Initial Size Reduction Process – items are shredded into pieces as small as 100mm to prepare the e-waste to be thoroughly sorted. This is also where the data destruction takes place.
- Secondary Size Reduction – the small debris is shaken to ensure that it is evenly spread out on the conveyor belt, before it gets broken down even more. Any dust extracted is disposed of in an environmentally friendly way.
- Over band Magnet – using magnets, steel and iron are removed from the debris.
- Metallic & Non-Metallic Content – aluminum, copper and brass are separated from the non-metallic content. The metallic can then be reused and resold as raw materials.

- Water Separation – water is used to separate plastic from the glass content. Once divided all raw materials can then be resold.

#### **5. India – The Digital Dumping Site :**

- It has been observed that, annually some 53 Millions Tones of e-waste are produced, predominately by developed nations. A majority of the waste is simply thrown away. Recent estimate have found that about 20 % of the waste is properly recycled, and remaining convert into e-waste.
- It is shocking to know that much of the waste find way to developing countries, particularly nations in Africa and Asia. India is also known as the digital dumping site for developed countries, Millions tones of e-waste dumped every year by USA and other countries in India.

#### **6. Technology in India and other countries.**

IT and telecom are two fastest growing industries in the country. India, by 2011, has achieved a PC penetration of 95 per 1000 from the 14 per 1000 in 2008. At present, India has 95 million one of the most threatening substances is lead, of which only 5 percent is recycled in India. USA discards 30 million computers each year and 100 million phones are disposed of in Europe each year. The Environmental Protection Agency estimates that only 15-20% of e-waste is recycled, the rest of these electronics go directly into landfills and incinerators.

- For safe and appropriate disposal of electronic waste, perfect and advanced technology is an urgent need of the hour for developing countries like India.
- However it has been observed that In India there is no advance technology for disposal of e-waste and combat its consequences. If we compare India with any other developed countries, India is more behind and therefore need more advanced technology for handling the E-waste.

#### **7. Conclusions:-**

- Awareness programmes on e-waste for school children and general public
- Governments should set up regulatory agencies in each district, which are vested with the responsibility of coordinating and consolidating the regulatory functions of the various government authorities regarding hazardous substances.
- Establishment of e-waste collection.
- Reusing and recycling methods needs to be further improved. & e-waste policy and Legislation.
- Encourage and facilitate organized recycling systems.

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