



PROCESSING AND RECYCLING, LLC

Technologies and Trends in Electronic Waste Disposal

The Importance of Electronic Waste Recycling

Facts

- Electronic waste (e-waste) has emerged as a new policy priority around the world.
- Motivations to address e-waste include rapidly growing waste streams, concern over the environmental fate of heavy metals and other substances in e-waste, and impacts of informal disposal in developing countries.
- Policy responses to global e-waste focus on banning international trade in end-of-life electronics, the premise being that e-waste is mainly generated in the developed world and then exported to the developing world.
- Results show that the volume of obsolete PCs generated in developing regions will exceed that of developed regions by 2016-2018. By 2030, the obsolete PCs from developing regions will reach 400-700 million units, far More than from developed regions at 200-300 million units. Future policies to mitigate the impacts of informal recycling should address the domestic situation in developing countries.

What is e-Waste?

- The term used to describe old, end-of-life or discarded appliances using electricity or batteries. It includes computers, consumer electronics, fridges etc which have been disposed of by their original users.

E-Waste

- The rapid obsolescence of gadgets combined with high demand for new technology has created mountains of E-Waste. E-waste is the fastest growing waste stream in the society today.
- Fastest growing toxic waste- laptops, mobile phones and other electronics.
- It has always been perceived as being “clean” but now it has been known that it is not as environmentally friendly as thought.

Trends

- Green IT can be defined as the holistic approach to environmentally friendly sustainable governance and management of the organization its process and projects.
- Environmentally friendly IT Asset Disposal (ITAD) is now a top priority for millions of businesses and consumers worldwide.
- Green IT is becoming more and more a corporate social responsibility for most businesses.

Existing & Emerging Technologies

- Responsible E-recycling
- Use of certified IT Asset Disposal (ITAD)
- Need to design Electronics whose different components and materials are easy to separate for disposal and /or reuse.

Challenges

- Poor design and complexity of electronics
- E waste is full of all kinds of materials e.g. metals, plastics, and chemicals that are mixed bolted, screwed, glued or soldered together. Toxic materials are attached to non toxic materials which are very difficult to separate.
- Responsible recycling requires intensive labor and / or sophisticated and costly technologies that safely separate these materials
- Awareness and information on dangers of E-Waste, Carbon dioxide (Co₂) emissions has been very limited.

Impacts

- Global ICT usage accounts for up to 2% of global Co₂ emission which is equivalent to aviation emissions which is no longer sustainable.
- Chemicals waste from the disposal of equipment pollutes the soil with Cadmium and Mercury.
- Gadgets result in high consumption of energy resulting in high energy budgets because all electronics use different types of energy.

Impacts contd..

- During standby and idle time the energy consumed may be classified as e-waste.
- During the said time, the electric and electronic gadgetry also emit carbon dioxide which contributes to e-waste stream.
- The idle time also eats into the lifetime of the gadgets resulting in a high turnover for e-waste.

Standards

Standards can act as a tool for intervention for stakeholders and business:

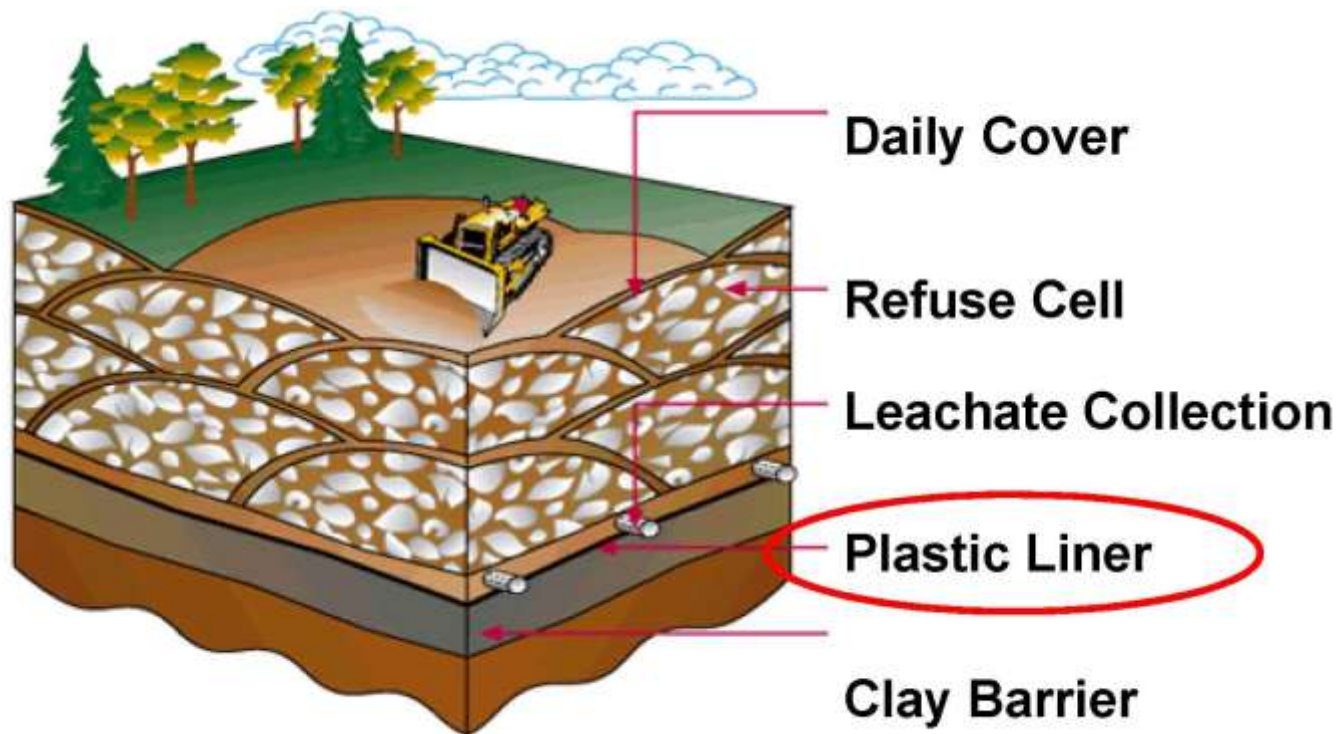
- For example, in India the Government has set guidelines on end producer responsibility on best practices for recycling
- The gadget makers line up for a green make over:
 - Handset makers, Nokia, Samsung and Motorola have started take back programs at various centers across cities.
 - Take back Bins for Nokia
 - Motorola = Ecomoto Program.
 - HP- Computers = Planet partners Recycling program offers customers assistance in disposal of used computers in an environmental responsible manner, including a trade in program.

Regulatory Regimes and Policy Framework on E-Waste

- Eco-labeling mechanisms as part of the regulatory and governance structure, such as AEM.
- Certification of responsible recycling bodies – e.g. E- Stewards which has been developed by a group of concerned recyclers under Basel Action Network (BAN) an environmental organization with the singular mission of eliminating the toxic trade in E -Waste with developing countries.
- Countries coming up with environment laws and regulations with specific articles on E-Waste management.
- Signing of International and regional protocols on environmental E-Waste management e.g. The Europeans
- Unions Waste Electrics and Electronics Equipment Directive (WEEE) of 2003.

America's Current Solution: eWaste destined to Landfills

E-Waste constitutes 40% of lead and 70% of heavy metals in landfills



What Are The Toxic Components?

Hazardous Waste

1. **Lead** in cathode ray tubes and solder.
2. **Arsenic** in older cathode ray tubes.
3. **Selenium** in circuit boards as power supply.
4. **Polybrominated flame retardants** in plastic casings, cables, and circuit boards.
5. **Antimony trioxide** as flame retardant.
6. **Cadmium** in circuit boards and semi-conductors.
7. **Chromium** in steel as corrosion protection.
8. **Cobalt** in steel for structure and magnetivity.
9. **Mercury** in switches and housing.



Add Nickel Cadmium batteries in all laptops and Hand Watches

Technologies & Knowledge

Does it really matter?

- There is no shortage of debate over the advantages of recycling. Plenty of staunch environmentalists argue that the energy required to recycle bottles and newspapers negates the benefit of creating reusable material. But abundant evidence demonstrates otherwise.
 - Stats:
 - 95% conserved through Aluminum recycling
 - 60% conserved through newspaper recycling
 - 70% conserved through plastics recycling
 - 40% conserved through glass recycling
- The energy conserved through recycling far outweighs the energy and emissions released by-products of incineration and the pollution caused by land filling.
- Recycling is an intermediary step. If we truly want to save energy and stem the stream of waste to send to landfills we will have to implement new industrial production systems that generate less waste and fewer disposal components to begin with.
- Recycling meanwhile, is certainly a worthy practice, and by simply tossing the right matter in the right bin.

Technologies & Knowledge cont..

- Education for sustainable consumption & development
- Eco-designs: End of life concepts
- Eco-taxation & Eco-economic instruments
- Ethical & fair trade practices

Do We Need National Legislation?

Yes, in a pragmatic approach encompassing:

- 1. Cultural approach including education and awareness
- 2. Industrial approach targeting importers and manufacturers in the country and supplier countries.
- 3. Market communication
- 4. Realistic standardization and enforcement

Proposed eWaste Solution

- Create incentives to recycle
- Large quantity generators \geq XX amount/year in tax credits
- Individual tax payers receive one YY amount credit/year for recycling one or more units of eWaste
- Re-evaluate program in a few years
- Make it illegal to throw away eWaste if adequate recycling infrastructure is available to public

Potential issues:

- Nothing in legislation mandates recycling center creation
- Re-use incentives noticeably absent