

Chapter 35

E–Waste Management: Challenges and Issues

Nina Godbole
IBM India Pvt. Ltd, India

ABSTRACT

Electronic Waste (e-Waste) is a major concern given the negative effects it creates on our environment. Huge quantities of e-Waste are generated every year and the rate is expected to rise in our digital economy. There are regulations and laws around e-Waste; however for its effective enforcement, all the relevant stakeholders need to come together to enforce the laws and regulations. In this chapter, the author describe the e-Waste problem, the challenges and issues involved and finally, present the life-cycle approach (cradle-to-grave) and finally, the author present a policy framework for effective e-Waste management.

INTRODUCTION TO E-WASTE

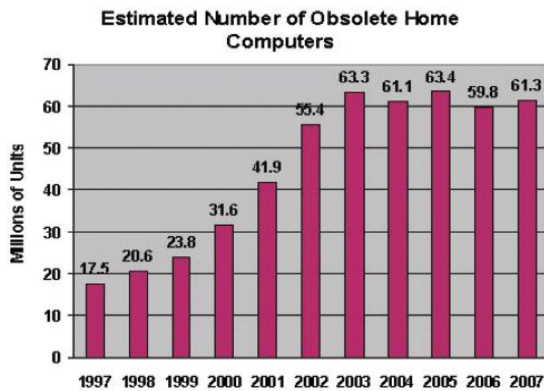
Electronic Waste ('e-Waste') is any litter created by discarded electronic devices and components as well as discarded and degenerating substances involved in their manufacture or use. e-Waste is the catch all term for 'electronic waste' that covers televisions, cell phones, microwaves, VCRs/DVD players, computer parts and monitors, printers, cables, batteries, CDs/DVDs, and much more. The other terms for e-Waste are or 'electronic waste' or 'waste of electronic goods' or WEE (waste

from electrical and electronic equipment). e-Waste 'is now recognized as the fastest growing waste stream in the industrialized world'. The total annual volume of e-waste is soon expected to reach 40 million metric tones (Ashley, MacDonald, Amos, 2008) –. The three major groups in which electronic waste contributors can be categorized are: computers, mobile phones and television sets.

Environmentally responsible use of computers (Green Computing) and related resources includes practices such as the implementation of energy-efficient central processing units (CPUs), servers and peripherals as well as reduced resource consumption resulting in the emerging

DOI: 10.4018/978-1-61692-834-6.ch035

Figure 1. Home computers obsolescence: 1997 to 2007 (Source: “Mandated Recycling of Electronics: A Lose-Lose-Lose Proposition” by Dana Joel Gattuso, Issue Analysis 2005 No. 2, Competitive Enterprise Institute, February 2005, <http://cei.org/pdf/4386.pdf>. (Obtained the Permission to use this Graphics, See mail at yahoo from Ivan Osorio, IOsorio@cei.org))



IT practices such ‘virtualization’ and ‘server consolidation’ and proper disposal of electronic waste. For the discussion, in this chapter, ‘green computing’ includes the ‘after life’ consideration about the harmful environmental effect of these products after they are discarded and also to bring in the ‘total life cycle’ approach (i.e. end-to-end) to e-Waste management thinking. Life cycle of electronic products spans from procurement/acquisition/manufacturing of the electronic products to their disposal.

To illustrate the e-Waste issue, the rising volumes of e-Waste generated for the computer category alone (due to rapid technological obsolescence), is seen in Figure 1 and the estimated quantity of e-Waste generated by a typical household is shown in Table 1.

This chapter investigates the challenges and issues faced by organizations dealing with electronic waste, particularly from an entire lifecycle of e-Waste perspective (Figure 2).

Table 1. Estimated quantity of electronic waste generated by a typical household http://www.hearusnow.org/fileadmin/sitecontent/HUN_WP_e-Waste_4-14-05.pdf - Consumers Union White Paper titled “Electronic Waste: Finding Sustainable Solutions that Work Better for Consumers”

Product	Approx Replacement Frequency (Years)	Number per Household	Total Units over 20 Years
Cell phone	2	2	20
Computer	3	1.5	10
Television	8	2.6	7
Compact Disk Player	6	2	7
Printer	4	1.4	7
PDA, Palm pilot, or MP3 player	6	1	3
VCR/DVD	5	1.7	7
Cordless telephone	7	1.5	4
Answering Machine	6	1	3
Estimated total number of units over 20 years: 68			

The health hazards due to e-waste are also discussed, together with the legal/regulatory and social frameworks applicable for governing e-waste. Best practices for the management of e-Waste, the regulatory compliance angle and standards aspects are reviewed, including the use of green metrics and how e-Waste cannot be calculated directly from the power bill of the company. Instead, a focus on the design, development, procurement and decommissioning of the equipment which eventually becomes e-Waste is proposed, including the separation of the carbon generation during the ‘active’ i.e. in use phase of these equipments, vis-à-vis the carbon impact when equipment (which were otherwise perfectly good and in working order) are discarded.

24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/waste-management-challenges-issues/48450

Related Content

Sustainable Urban Development

Suharto Teriman, Tan Yigitcanlarand Severine Mayere (2011). *Green Technologies: Concepts, Methodologies, Tools and Applications* (pp. 171-185).

www.irma-international.org/chapter/sustainable-urban-development/51696

Coastal Web Atlas Features

Elizabeth O'Dea, Tanya C. Haddad, Declan Dunneand Kuuipo Walsh (2011). *Coastal Informatics: Web Atlas Design and Implementation* (pp. 12-32).

www.irma-international.org/chapter/coastal-web-atlas-features/45077

Sustainable Product Service Systems

David Ness (2011). *Green Technologies: Concepts, Methodologies, Tools and Applications* (pp. 540-555).

www.irma-international.org/chapter/sustainable-product-service-systems/51716

Green ICT and Architectural Frameworks

Amit Goel, Amit Tiwaryand Heinz Schmidt (2011). *Handbook of Research on Green ICT: Technology, Business and Social Perspectives* (pp. 546-558).

www.irma-international.org/chapter/green-ict-architectural-frameworks/48455

Factors Affecting Customers' Perceptions and Firms' Decisions Concerning Online Fast Food Ordering

Eugenia Papaioannou, Christos K. Georgiadis, Odysseas Moshidisand Athanasios Manitsaris (2015). *International Journal of Agricultural and Environmental Information Systems* (pp. 48-78).

www.irma-international.org/article/factors-affecting-customers-perceptions-and-firms-decisions-concerning-online-fast-food-ordering/120472