

E-WASTE GENERATION IN INDIA: A SURVEY

Geenu Raheja

Department of Applied Science, THAPAR UNIVERSITY, PATIALA

Abstract: Over the recent past, the global market of electrical and electronic equipment (EEE) has grown exponentially, while the lifespan of these products has become increasingly shorter. More of these products are ending up in rubbish dumps and recycling centers, posing a new challenge to policy makers. The purpose of this paper is to provide a review of the e-Waste problem.

I. INTRODUCTION

Electronic waste (e-waste) is currently the largest growing waste stream. It is hazardous, complex and expensive to treat in an environmentally sound manner, and there is a general lack of legislation or enforcement surrounding it. Today, most e-waste is being discarded in the general waste stream. Such globalization of e-waste has adverse environmental and health implications. In the 20th Century, the information and communication revolution has brought enormous changes in the way we organize our lives, our economies, industries and institutions. These spectacular developments in modern times have undoubtedly enhanced the quality of our lives. At the same time, these have led to manifold problems including the problem of massive amount of hazardous waste and other wastes generated from electric products. These hazardous and other wastes pose a great threat to the human health and environment. The issue of proper management of wastes, therefore, is critical to the protection of livelihood, health and environment. It constitutes a serious challenge to the modern societies and requires coordinated efforts to address it for achieving sustainable development.

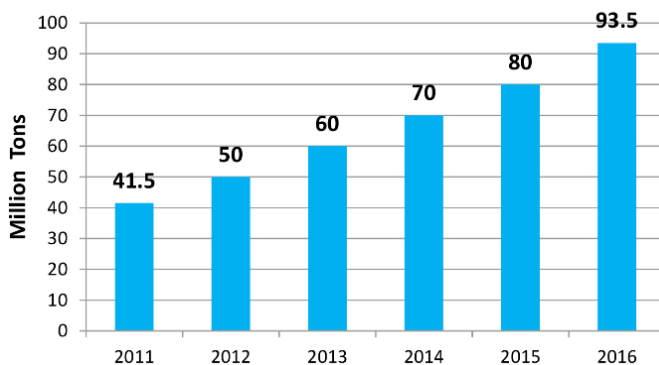


Fig 1: E-Waste Volume Growth

II. COMPOSITION OF E-WASTE

E-waste consists of all waste from electronic and electrical appliances which have reached their end-of-life period or are no longer fit for their original intended use and are destined for recovery, recycling or disposal. It includes computer and its accessories monitors, printers, keyboards, central processing units; typewriters, mobile phones and

chargers, remotes, compact discs, headphones, batteries, LCD/Plasma TVs, air conditioners, refrigerators and other household appliances[1]. The composition of e-waste is diverse and falls under 'hazardous' and 'non-hazardous' categories. Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood and plywood, printed circuit boards, concrete, ceramics, rubber and other items. Iron and steel constitute about 50% of the waste, followed by plastics (21%), non-ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals like silver, gold, platinum, palladium and so on[2]. The presence of elements like lead, mercury, arsenic cadmium, selenium, hexavalent chromium, and flame retardants beyond threshold quantities make e-waste hazardous in nature. It contains over 1000 different substances, many of which are toxic, and creates serious pollution upon disposal[3]. Obsolete computers pose the most significant environmental and health hazard among the e-wastes.

III. E-WASTE GENERATION IN INDIA

All over the world, the quantity of electrical and electronic waste generated each year, especially computers and televisions, has assumed alarming proportions. In 2006, the electrical appliances would become WEEE or e-waste by 2010[4]. That would tantamount to an average e-waste generation rate of 400 million units a year till 2010. Globally, about 20-50 MT (million tonnes) of e-wastes are disposed off each year, which accounts for 5% of all municipal solid waste[5]. Although no definite official data exist on how much waste is generated in India or how much is disposed of. In 2005, the estimated India's e-waste at 1.47 lakh tonnes or 0.573 MT per day[6] & estimated the total e-waste generation in India at a whopping 4.34 lakh tonnes by end 2009.[7] it will exceed the 8 lakh tonnes or 0.8 MT mark by 2012.[8] There are 10 States that contribute to 70 per cent of the total e-waste generated in the country, while 65 cities generate more than 60 per cent of the total e-waste in India. Among the 10 largest e-waste generating States, Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab. Among the top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bengaluru, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur.[9] The main sources of electronic waste in India are the government, public and private (industrial) sectors, which account for almost 70 per cent of total waste generation. The contribution of individual households is relatively small at about 15 per cent; the rest being contributed by manufacturers. Though individual households are not large contributors to waste generated by

computers, they consume large quantities of consumer durables and are, therefore, potential creators of waste[10]. In 2009 found that out of the total e-waste volume in India, televisions and desktops including servers comprised 68 per cent and 27 per cent respectively. Imports and mobile phones comprised of 2 per cent and 1 percent respectively.

IV. GROWTH OF ELECTRICAL AND ELECTRONIC INDUSTRY IN INDIA

India, in the last couple of decades, has also been vastly influenced by the culture of consumerism. The application of electronics related technology has been very wide spread in all sectors. Coupled with the rapid pace of industrialization, Personal Computers (PCs) —desktops and notebooks, televisions and mobile phones and other manufacturing items like refrigerators have experienced high growth and even faster replacement cycle. The electronics manufacturing industry has emerged as one of the most innovative industries in the world over. It is constantly engaged in creating and utilizing new technologies. This has also partly contributed to what is called inbuilt product obsolescence. This has resulted into an ever increasing quantity of electronics and electrical appliances being discarded, as it is often cheaper to buy new product than to repair or upgrade a broken or obsolete one.

4.1 Computer components segment: The electronics industry is driven mainly by the computer and computer component sectors with as much as a fifth of its revenues coming from sales of Personal Computers. The huge scale of demand in the market can be observed from the sale of the P.Cs. Personal computers sales have seen a major jump in the last few years from around units of 3.1 million in 2003-04 to 7.3 million in 2007-08 approximately. It dropped to 6.7 million units in 2008-09 during the recession but the industry once again picked up in 2009-10. The total sales of personal computers for the quarter October - December 2009 were 2 million (20 lakh) units, registering a growth of 42 per cent over the same period in the previous fiscal year. In the same quarter, the sales of desktops stood at 1.35 million (13.5 lakh) units, while netbooks and notebooks taken together recorded a consumption of 0.66 million (6.6 lakh) units growing 27 per cent and 90 per cent respectively, on a year-on-year basis. Overall PC sales for 2009-10 are expected to cross 7.3 million (73 lakh) units, registering a 7 per cent annual growth.[11]

4.2 The Consumer Electronics (Television) segment: In the television segment, the advent of the Liquid Crystal Display (LCD) and plasma screens has altered the concept of the television for viewers. Better technology has meant improved picture quality and a diminishing price difference between the traditional CRT (Cathode Ray Tube) television and the new flat screen LCD television. It has resulted in the popularity of the latter. Moreover, increasing disposable income and the price decline influenced by robust demand has been factoring the growth in this segment. A phenomenal rise in the sale volume of the flat panel color television by 70.9 per cent in 2007 as against just over 33 per cent of the

CRT color television demonstrates this new trend.. The flat panel CTV segment formed 64.3 per cent of the entire market, worth Rs. 2,545.81 crore with a total of 27,34,000 units sold during the period. The conventional curve CTV segment stood at 33.5 per cent of the whole market, worth Rs. 813.28 crore (14, 26,600 units).[12] According to a report on Indian Consumer Durables Industry by the Corporate Catalyst India, the sales trend of television indicated that sales would go up from 8,867,000 units in 2005 to 11,795,000 units in 2010. According to Display Search, a leading global provider of consumer and retail market research, globally, overall TV shipments were expected to rise from 205 million units in 2008 to 218 million units by 2010.[13]

V. E-WASTE PROJECTION AND RECYCLING IN FOUR MAJOR CITIES

The two main hubs where e-waste is re-cycled in the country are Delhi and Mumbai. The other two major hubs are Hyderabad and Bangaluru which have been the centres of the electronics and information technology industry. They are among the top ten cities in India which have been generating e-waste. Their status as primary centres of the e-waste recycling process - whether it concerns storage, dismantling, recycling, refurbishing, and distribution - has been a predictable fall-out of the electronic industrial growth and development in these cities.

VI. CONCLUSION

All types of waste are not only imported but generated in India hazardous industrial waste, municipal solid waste and e-waste. The quantum of wastes generated over the past several years have posed an ever increasing threat to environment and public health. Pollutants from such zones contaminate water bodies and rivers and even pollute the ground water in many places. Studies have also shown that crops are contaminated through industrial effluents but the scale of such an impact has yet to be identified. As far as e-waste is concerned, it has emerged as one of the fastest growing waste streams world wide today. The sheer amount of electronic equipment's reaching end-of-life poses a huge challenge. Computers and electronics equipments are designed without giving sufficient attention to the aspects such as downstream impacts, and the ease of recycling. In future, we have to find a best suitable method to reduce the effects of e-waste. Otherwise a dangerous effect would be seen in the future.

REFERENCES

- [1] 'China RoHS', Wikipedia, <http://en.wikipedia.org/wiki/China_RoHS> Last modified: 09 October, 2010.
- [2] Electronics.ca Research Network, 'Optical Components Worldwide: Markets Reach \$11.3 Billion by 2015', 29 September, 2009
- [3] Electronics.ca Research Network, 'Worldwide Electronic Manufacturing Services Will Return to Steady, But Uneven Growth in 2010', 26 April,

- 2010,
- [4] Electronics Recycling', Institute of Scrap Recycling Industries Inc. (ISRI)
 - [5] 'Electronic Waste in the United States', Wikipedia, <<http://en.wikipedia.org>> Last modified: 16 October, 2010.
 - [6] International News on Electronic Recycling, IAERNewsletter, January, 2009
 - [7] 'IT's underbelly', Down to Earth, Vol.19, No.1, May16-31,2010.
 - [8] 'Japan "Twisting Arms" of Asian Neighbours to Take ToxicWaste', Greenpeace, 16 February, 2007
 - [9] JayantiGhosh, 'Digital Dumps', Frontline, Vol. 25, Issue-05, March 01-14, 2008.
 - [10] 'Mumbai: Choking on e-waste—A study on the status of e-waste in Mumbai', Toxics Link, 23 February, 2007.
 - [11] 'Mumbai to Start First Re-cycling Plant', EBR (Energy Business Review), 6 July, 2009,
 - [12] 'New study identifies India's e-waste potential', Recycling International, 17 March, 2009
 - [13] 'Restriction of Hazardous Substances Directive', Wikipedia,