

E-waste Management : Corporate Sustainability through IT Sector

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E-waste or electronic waste refers to the electronic items that are no longer in order or are dead and are needed to be disposed off. Poorly disposed e-waste harms the environment; internal components of discarded items usually contain heavy metals like zinc, lead and barium that leach through soil, get emitted into the air or worse, end up as toys with the kids. The aim of this paper is to discuss the various environmental techniques used by a few top IT companies of the world who have taken upon the challenge to reduce e-waste. Through this paper we find out how HP, Dell and TCS are doing their part to save the environment.

Keywords: E-wastes, electronics, IT Sector, corporate, recycle, HP, Dell, TCS,

INTRODUCTION

With more than 40 million PCs ready to reach end of their life-cycle, the disposal is the topic talked most about in current world scenario. Technological advancement and their growth are in rapid pace resulting in excess hardware that is potentially dangerous to world's ecosystem. If disposal of these hazardous materials keeps taking place in the regular fashion, the world's ecosystem would continue to degrade at a faster rate, resulting in release of toxin in land, water and atmosphere. To prevent this, Environmental protection agency (EPA) are setting the guidelines which are now followed by many companies worldwide.

So, why e-waste is a problem? This is the time of rapid technology changes, but the adaptations to these technological changes are not swift. We are placed in the blind side of the e-waste problems. Here, we would be discussing about various initiatives and projects taken up by different IT Sector giants. Corporate sustainability is much required right now, where the e-waste generated is the highest.

What are e-wastes? A list of E-waste typically generated in IT sector as per Annexure IB of the WEEE Directives is given below for reference:

1.	Centralized data processing	13.	User terminals and System
2.	Main Frames	14.	Lighting equipment
3.	Printer Units	15.	Audio/ Video conferencing System
4.	Mini Computers	16.	LCD Monitors, Projectors, Plasma Screens
5.	Personal Computing	17.	Photocopying machines, toners
6.	Personal Computers *(CPU, Mouse, Screen, Key Board included)*	18.	Refrigerators/Deep Freezers
7.	Laptop Computers* (CPU, Mouse, Screen, Key Board included)*	19.	Smoke Detectors/Heat Regulators
8.	Note Book Computers	20.	Automatic Dispensers for hot drinks.
9.	Note Pad Computers	21.	Air Conditioner appliances
10.	Printers	22.	Telephone, telex, facsimile and other telecommunication system
11.	Copying Equipment	23.	Other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means.
12.	Pocket and Desk Calculators		

Source: <http://www.tcs.com/>

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There are a lot of health issues also, faced by e-wastes around the globe!

Table 1: Effects of E-Waste constituent on health

Source of e-wastes	Constituent	Health effects
Solder in printed circuit boards, glass panels and gaskets in computer monitors	Lead (Pb)	<ul style="list-style-type: none"> • Damage to central and peripheral nervous systems, blood systems and kidney damage. • Affects brain development of children.
Chip resistors and semiconductors	Cadmium (Cd)	<ul style="list-style-type: none"> • Toxic irreversible effects on human health. • Accumulates in kidney and liver. • Causes neural damage. • Teratogenic.
Relays and switches, printed circuit boards	Mercury (Hg)	<ul style="list-style-type: none"> • Chronic damage to the brain. • Respiratory and skin disorders due to bioaccumulation in fishes.
Corrosion protection of untreated and galvanized steel plates, decorator or hardener for steel housings	Hexavalent chromium (Cr VI)	<ul style="list-style-type: none"> • Asthmatic bronchitis. • DNA damage.
Cabling and computer housing	Plastics including PVC	Burning produces dioxin. It causes <ul style="list-style-type: none"> • Reproductive and developmental problems; • Immune system damage; • Interfere with regulatory hormones • Disrupts endocrine system functions
Plastic housing of electronic equipments and circuit boards.	Brominated flame retardants (BFR)	
Front panel of CRTs	Barium (Ba)	Short term exposure causes: <ul style="list-style-type: none"> • Muscle weakness; • Damage to heart, liver and spleen.
Motherboard	Beryllium (Be)	<ul style="list-style-type: none"> • Carcinogenic (lung cancer) • Inhalation of fumes and dust. Causes chronic beryllium disease or berylliosis. • Skin diseases such as warts.

Source: <http://wgbis.ces.iisc.ernet.in/energy/paper/ewaste/ewaste%20management.pdf>

Literature Review: This e-waste paper is a permutation of numerous research works. The methods of reconditioning the e-waste are being discussed in this paper.

RESEARCH METHODOLOGY

This paper is based on secondary data analysis and is constructed on the data collected and information congregated from the various websites of the IT companies. Different research papers and numerous documentaries have been comprehended for gathering information regarding the collection, disposal and recycling of the concerned e-wastes generated in US, India and all across the globe. The collected information was analysed to develop an understanding of existing initiatives and projects undertaken by several IT companies.

OBJECTIVES

- 1) To identify the e-wastes generated by various IT companies around the globe.
- 2) To describe what are the steps taken by the IT Sector to recycle, refurbish and recondition the e-waste.

- 3) To compare the different strategies of different IT companies with common denominator of e-waste.
- 4) To collect various data on the companies' role in e-waste management.

FINDINGS

Little things can have a dramatic impact on the environment and it seems HP understands that. According to HP's website, "HP produces low-carbon solutions and energy-efficient products, using safer materials and greener packaging to lower our customers' environmental footprints and is also embracing the circular economy across its value chain."¹

Under the umbrella term of "Environment", HP is branching-out to various sectors for sustainable development. One of its operations covers product reuse and recycling. It is an industry leader in product take-back programs, which began in 1987. When its products have served its mechanical life's purpose, it takes proper responsibility to reuse and recycle them. HP has an innovative "closed loop" recycling program in which plastic from HP ink and

toner cartridges is combined with other plastics to create new HP ink or toner supplies as printing a document doesn't harm the environment directly however the waste of ink and cartridges does. The plastic is recovered via the HP Planet Partners program. HP Planet Partners program was developed in collaboration with recycling and materials supplier partners. They collect used products for resale and recycling in 74 countries and territories worldwide and provide their customers with comprehensive, responsible reuse and recycling programs globally. HP claim's on their website that in the last 11 years HP's solution has used over 177 million pounds of recycled plastic from over 682 million HP cartridges, 3.3 billion water bottles and, 50 million apparel hangers to manufacture over 3 billion closed-loop cartridges. More than 80% of our ink cartridges and 38% of HP LaserJet toner cartridges are now manufactured with closed-loop recycled plastic. (Ink cartridges that include recycled plastic contain 45 - 70% recycled plastic; HP LaserJet toner cartridges that include recycled plastic contain 10 - 33% recycled plastic). "They only recycle products that cannot be reused. Since 1987, HP Planet Partners have recovered 1,683,000 tons (3.71 billion pounds) of computer hardware (for reuse and recycling) and HP supplies (for recycling) and have recycled more than 3.3 billion pounds of products.

One of the major highlights of HP's environment awareness programs is their "Take-Back Programs." HP has taken the responsibility of recycling old and defunct IT assets. Improper disposal of such equipment's could harm various walks of life and poor handling can put people's information at risk. Therefore, HP offers secured and responsible services like:

- Complete destruction and recycling at state-of-the-art recycling facilities
- Onsite data annihilation (degaussing or shredding)
- Asset tracking, auditing, and certificates of destruction
- Complete transportation and logistics synchronisation

Their global network of vendors collect, process them for resale or recycles returned products. In the United States, they have partnered with major retailers to provide easy access for consumers in returning their items. And the entire process is tied by strict norms to ensure that returned products go

through a data-cleansing process to ensure customer privacy.

After a hardware product has been returned, determination of the best recovery solution is their first priority. They preferred an option with the lowest environment impact, like many other hardware companies, to refurbish and resell equipment when it has resale value.

HP mentions on their website about recycling returned hardware that is unsuitable for reuse. They cofounded European Recycling Platforms. It provides take-back and recycling services to HP and other companies in Europe. Consumers in United States can drop off hardware products for recycling at more than 3,700 Staples and FedEx Office locations. If they prefer, they can use HP's Consumer Buyback Program to return IT equipment of any brand in exchange for money or purchase credits if the product has some value. If the equipment had to be destructed, consumer can also request Certificates of Destruction "that verifies that products were destroyed through the recycling process, that the data on the products cannot be accessed by anyone else, and that the recycling methods used; met or exceeded applicable environmental regulations." HP Planet Partners have authorized collection sites, at more than 11,000 drop-off locations worldwide.

For smooth processing, HP has contract with Environmental Resources Management (ERM) to audit their recycling vendors against HP policies and vendor standards. In 2014, through ERM, it audited 72 vendor facilities (29 reused and 43 recycling) in 24 countries. This included repeat audits of 39 vendors to confirm their ongoing commitment towards improved performance.

According to Barbara Kyle, National Coordinator of 'Electronics TakeBack Coalition', Dell's policy on e-waste export is now strongest in the industry. Dell, in 2009, banned the export of non-working electronics and e-waste to developing countries such as India, China, and, Africa. In FY 2015, Closed-loop Recycling strategy was used by Dell. With the launch of 'Optiplex 3030' all-in-one, Dell became the first in the industry to offer a desktop made up of recycled plastics that are third party certified (by UL Environment) as closed loop. Also, in the year 2015, Dell signed 5-years agreement with United Nations Industrial Development Organization (UNIDO) to cooperate on identifying and implementing a sustainable e-waste management model for

developing countries in Africa, Asia and Latin America. Dell also, had setup an e-waste recycling hub and collection Network in Kenya in FY2014.

While Dell is undertaking their share, TCS is also leading the e-waste management with complete promptness.

Under waste management and corporate sustainability, TCS is unfailingly following the matrix of Profit, People and Planet. As the charity begins at home, TCS makes a conscious effort in their offices. It is the responsibility of every associate to separate their wastes into recyclable materials and place them in the proper recycling bins. All offices across TCS must purchase and sell the goods made up of recyclable materials. The implementation of the office of Waste Reduction and Recycling will work towards making the office and surroundings free from e-waste.

'Green Desktop Infrastructure' adopted by TCS is an approach to reduce desktop carbon footprint.

CONCLUSION

With our research about various IT companies, we gained knowledge regarding how much HP, Dell and TCS are vigilant towards environment and things that can harm it. Each company has taken varied measure to reduce their carbon footprint thus minimising the effects of e-waste to a certain level. We conclude this paper in hope that these companies will continue to do so and many more IT firms will try to follow their footsteps.

RECOMMENDATIONS

- 1) Spreading awareness at a right young age, so as to catch up with our "free-from-e waste" future slightly early.

- 2) A standardized process must be mentioned by government authority for collection and disposal of the hazardous e-wastes.

- 3) The designers and manufacturers must design the product for disassembling and maintenance. The products must be designed for remanufacturing.

GAPS

Although, we tried not to miss on any aspect however due to limited sources, we couldn't thoroughly contact the above discussed firms personally for better understanding of their mentioned programs. Also this paper doesn't include various other small-scale industries who are doing their part in saving the threatened environment.

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