



## From Editor's Desk

This issue is focused on E-WASTE, which is one of the fastest growing waste streams in the world. The electronic equipment contains different hazardous materials, which are harmful to the human health and the environment. Today, consumers are drawn towards latest technology, which is a result of 'Disposable' mindset where products are replaced rather than repaired. The growth of E-WASTE has also significant economic and social impact.

For sustainable development, the State Government of Gujarat has announced various incentive financial schemes in its Industrial Policy 2009 to promote environmental protection and greener practices for industries like CP/CT concept. A mention of this is also covered in this issue.

Editor



### INSIDE THIS ISSUE :

E-Waste	2-10
Book Review	11

## E-WASTE

From California to Calcutta, Stockholm to Sialkot or London to Lucknow, electronics are changing the lives of people everywhere. They are touching every aspect of our lives- the way we do business, keep in touch with family, bring up children or entertain ourselves. And in the wake of this 21st century revolution, looms a disaster that is sure to damage the quality of our lives and that of generations to come. The problem of electronic waste or E-waste requires urgent global action.

“E-waste” is a popular, informal name for electronic products nearing the end of their “useful life”. E-wastes are considered dangerous, as certain components of some electronics products contain materials that are hazardous, depending on their condition and density. The hazardous content of these material pose a threat to human health and environment. Discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem.



### Definition

Electronic waste (e-waste) comprises waste electronics/electrical goods that are not fit for their originally intended use and are destined for recovery, recycling or disposal. This may include items such as computers, servers, mainframes, monitors, CDs, printers, scanners, copiers, calculators, fax machines, battery cells, cellular phones, transceivers, TVs, medical apparatus, refrigerators and air-conditioners etc. E-waste contains valuable materials such as copper, silver, gold and platinum which could be processed for their recovery.

### Major contributors to the e-waste Stream

#### ◆ Individuals and Small Businesses:

Due to new technologies, the rate of obsolescence is very high. Thus electronic equipment and computers in particular, are often discarded by households and small businesses, not because they are broken but simply because new technology has rendered them obsolete.

#### ◆ Large corporations, institutions & government:

Large users upgrade employee computers regularly. For example, Microsoft, with over 50,000 employees worldwide (some of whom have more than one computer) replaces each computer about every three years. By law it is illegal for these large users to dispose off computers via landfill and thus, this e-waste goes to the re-use/ recycling / export market.

#### ◆ Original Equipment Manufacturers (OEMs):

OEMs generate e-waste when units coming off the production line don't meet quality standards, and must be disposed off. Some of the computer manufacturers contract with recycling companies to handle their electronic waste, which often is exported.

### Reasons for growth

- ❖ Due to the increasing areas of information society and the dependency of businesses on computer and Internet, the e-waste has been mounting. Perhaps e-waste is the fastest growing segment of the municipal solid waste stream. E-waste has been mounting rapidly with the rise of the information society.
- ❖ Due to rapid Globalization the World economics has drastically changed. This has tremendous effect on mankind.

**Table 1-Discard rate of electronic items**

☐ Mobile Phone	1 to 3 years
☐ PC	Every 2 years
☐ Camera	3 to 5 years
☐ Television	10-15 years
☐ Refrigerator	10-15 years
☐ Washing Machine	10-15 years
☐ I.T. accessories	Very fast



- ❖ Less costly components used in the electronic equipments.
- ❖ Along with that, the rate of obsolescence of electronic equipment is increasing. The life-cycle of the electrical and electronic equipment are shortening. The life period of a television set is reduced to 10 years while that of a computer remains only 2-3 years.
- ❖ Low cost of products.
- ❖ Purchasing power increase.
- ❖ Inability of technology to support up gradation.
- ❖ Modern Lifestyle.

**Table 2- Average PC of approx. 31.5 kg wt. contains:**

<b>7.24 kg</b>	<b>Plastics</b>
<b>1.98 kg</b>	<b>Lead</b>
<b>0.693 g</b>	<b>Mercury</b>
<b>0.4095g</b>	<b>Arsenic</b>
<b>2.961g</b>	<b>Cadmium</b>
<b>1.98g</b>	<b>Chromium</b>
<b>9.92g</b>	<b>Barium</b>

The advent of 'use and throw', 'low value-low life' CHINA MOBILES has caused havoc in e-waste.

Microsoft's new operating system launched in January 2009 -- Windows Vista -- will make many older machines obsolete and create a "Tsunami of e-waste"

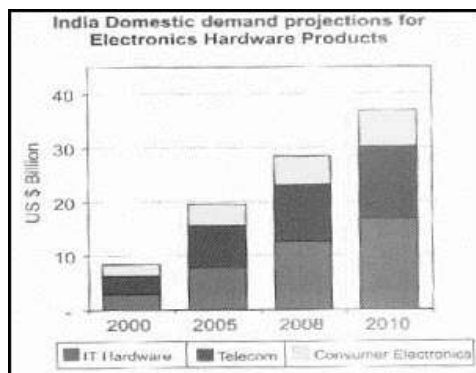
## E-waste Generation Scenario

### ◆ International Scenario :

In USA, it accounts 1% to 3% of the total municipal waste generation. In European Union (EU), e-waste is growing three times faster than average annual municipal solid waste generation. A recent source estimates that total amount of e-waste generation in EU ranges from 5 to 7 million tonnes per annum or about 14 to 15 kg per capita and is expected to grow at a rate of 3% to 5% per year. In developed countries, currently it equals 1% of total solid waste generation and is expected to grow to 2% by 2010.

### ◆ Indian Scenario :

The growth rate of discarded electronic waste is high in India since it has emerged as an Information Technology giant and due to modernization of lifestyle. We are using electronic products for last 60 years. However, there is no proper disposal system followed in our country and that has lead to enormous amount of e-waste. There is a need to find proper disposal and recycling technique so that environmental pollution and health hazards can be reduced. Following graph projects the increasing demand for electronics hardware products in India.



- The total e-waste generated in India amounts to 1,46,180 tonnes per year.
- Sixty-five cities in India generate more than 60% of the total e-waste generated in India.
- Ten states generate 70% of the total e-waste generated in India (Table 3A).
- Among top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bangalore, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur (Table 3B).
- In India, increased demand for key products like PC, TV and Telephones in last 5-10 years has been responsible for the increasing amount of e-waste generation.

State	WEE (Tonnes)
Maharashtra	20270.59
Tamil Nadu	13486.24
Andhra Pradesh	12780.33
Uttar Pradesh	10381.11
West Bengal	10059.36
Delhi	9729.15
Karnataka	9118.74
Gujarat	8994.33
Madhya Pradesh	7800.62
Punjab	6958.46

City	WEE (Tonnes)
Ahmedabad	3287.5
Bangalore	4648.4
Chennai	4132.2
Delhi	9730.3
Hyderabad	2833.5
Kolkata	4025.3
Mumbai	11017.1
Nagpur	1768.9
Pune	2584.2
Surat	1836.5

Source : [www.maharashtra.gov.in](http://www.maharashtra.gov.in)

### State Scenario:

In India, among the 10 states, Maharashtra ranks first in the e-waste generation. The total e-waste generation in Maharashtra accounts for 20,270.6 tonnes per year. It shows that Mumbai and Pune generates maximum amount of e-waste. This is due to the presence of a large number of Info Tech Parks & electronic products manufacturing companies situated in these areas, which plays the main role in e-waste generation.

CPCB has identified Pune as one of the top ten cities generating e-waste. According to MPCB, more than 19,000 tonnes of e-waste is generated in Pune and Pimpri-Chinchwad area and the projected growth in the e-waste is estimated at 3,500 tonnes a year.

### Potential Health and Environmental Hazard of E-waste

E-waste contains over 1,000 different substances and chemicals, many of which are toxic and are likely to create serious problems for the environment and human health if not handled properly. However, classification of e-waste as hazardous, or otherwise, depends on the amount of hazardous constituents present in it. E-waste contains many toxics such as heavy metals, including lead, cadmium, mercury, Polychlorinated Biphenyls (PCBs), Poly Vinyl Chloride (PVC), etc.

**Table 4- Potential Health & Environmental Effects due to E- waste**

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

Some of these items include computers, batteries and cellular phones, which have become staples in almost every home and office. One can just imagine the millions of tonnes of waste should these pieces of equipment be allowed to rot. Minerals found on earth are nonrenewable resources and should these be used up and depleted due to the presence of tiny yet deadly particles, all of us will suffer. Computers, for one, have tiny, bioaccumulative compound particles that could pose harm not only to animals and to bodies of water, but to humans as well. Batteries, on the other hand, contain cadmium, lead and mercury. If batteries are carelessly thrown out, they can end up in incinerators and landfills. The earth's surface may seep the toxic ingredients of batteries and this may lead to soil and water contamination. Open burning and acid bath of waste boards, leads to air pollution.

### India a dumping ground

End-of-life products find their way to recycling yards in countries such as India and China, where poorly-protected workers dismantle them, often by hand, in appalling conditions. About 25,000 workers are employed at scrap-yards in Delhi alone, where 10,000 to 20,000 tonnes of e-waste is handled every year, with computers accounting for 25 percent of it. Other e-waste scrap-yards exist in Meerut, Firozabad, Chennai, Bangalore and Mumbai. About 80 percent of the e-waste generated in the US is exported to India, China and Pakistan, and unorganized recycling and backyard scrap-trading forms close to 100 percent of total e-waste processing activity. Many of India's corporations burn e-waste such as PC monitors, PCBs, CDs, motherboards, cables, toner cartridges, light bulbs and tube-lights in the open along with garbage, releasing large amounts of mercury and lead into the atmosphere.

## Why exported to India???

- > Cheap labour
  - US - \$ 30/ computer
  - India - \$ 2/ computer
  - Saving - \$ 28/ computer
- > Weak environmental laws
- > Excess dumping of CRT tubes due to the ramp walk of flat screen monitors
- > Driven by the potential for corporate profits

## E-waste recycling

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### In March, 2008 Ministry of Environment & Forests had released Guidelines for Environmentally sound management of E-waste.

The objective of the guidelines is to provide guidance for identification of various sources of E-Waste and prescribed procedure for handling e-waste in an environmentally sound manner. These guidelines provide the minimum practice required to be followed in the management of e-wastes and the State Department of Environment OR State Pollution Control Board may prescribe more stringent norms as deemed necessary. These guidelines applies to all those who handle e-waste which includes the generators, collectors, transporters, dismantlers, recyclers and stake holders of e-wastes irrespective of their scale of operation.

In the guidelines, environmentally sound E-waste treatment technology is identified at three levels. All three levels of e-waste treatment are based on material flow. Each level treatment consists of unit operations, where e-waste is treated and out put of first level treatment serves as input to second level treatment. After the third level treatment, the residues are disposed of either in TSDF or incinerated. The efficiency of operations at first and second level determines the quantity of residues going to TSDF or incineration.

### Why Recycle?

- ⇒ Volume–Used or unwanted electronics amounted to approximately 1.9 to 2.2 million tonnes–Of that, about 1.5 to 1.9 million tonnes were primarily discarded in landfills–Only 3,45,000 to 3,79,000 tonnes were recycled.
- ⇒ Toxicity–Electronics items also contain hazardous metal and substances which may cause potential health and environmental effect.
- ⇒ Value–Electronics may contain precious metals– Recyclers recover more than 45,000 tonnes of materials from electronics each year.

Most of the activity in Recycling of e-waste involves physical dismantling by hammer, chisel, screw driver and bare hand. The most high- tech piece of dismantling equipment witnessed was an electric drill. The immediate objective of most of the operations involves dismantling and rapid separation of primary materials. The following materials were observed being separated for further recycling:

- ◆ **Material containing copper:** Including printer and other motors, wires and cables, CRT yokes, circuit boards, etc
- ◆ **Steel:** Including internal computer frames, power supply housings, printer parts, washing machines, refrigerator, etc.
- ◆ **Plastic:** Including housings of computers, printers, faxes, phones, monitors, keyboards, etc.
- ◆ **Copper:** Extracted from transformer and CRT after their dismantling.
- ◆ **Circuit Boards:** These come from many applications including computers, phones, disc drives, printers, monitors, etc.

## 1. Printed Circuit Boards (PCBs)

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The printed circuit boards contain heavy metals such as antimony, gold, silver, chromium, zinc, lead, tin and copper. According to some estimates, there is hardly any other product for which the sum of the environmental impacts for raw material, industrial refining and production, use and disposal is as extensive as for printed circuit boards. The methods of salvaging material from circuit boards are highly destructive and harmful as they involve heating and open burning for the extraction of metals. Even after such harmful methods are used, only a few of the materials are recovered. The recycling of circuit boards, drawn from monitors, CPU, disc and floppy drives, printers, etc. involves a number of steps.

### Extraction of IC/ other components from PCB

IC/other components from PCBs are manually extracted as shown in Figure 1. This Process is common for PC, TV and cell-phone. The E-waste stream from cell-phone joins the E-waste stream of PC and TV.

**Figure 1: Extraction of IC/ other components from PCB**



### Recovery of Gold

Gold pins are recovered from PCB manually as shown in Figure 2. First, there is manual removal of gold-plated pins. The core of each motherboard has a flat laminated gold plate. These laminated parts are cut down and sold to gold-smiths for gold recovery.

**Figure 2: Gold Recovery**



### Preheating of PCB and extraction of components

The preheating process is applied to remove resalable components like ICs, condensers, bearings (pulleys) from floppy drive and hard drive. Pre-heating means simply putting the motherboard on a burning stove as shown in Figure 3. Low heat is maintained to loosen only the chemical bond between solder and plastic. Then resalable chips, condensers, etc. are plucked out from these pre-heated plates. Then the pre-heated circuit boards are taken by other dealers for recovery of solder (which consists of lead and mercury). The method of solder recovery is very rudimentary. The lead extracted due to heat application goes into a water tub – it floats due to low density.



**Figure 3: Preheating of PCB**

## 2. Monitors

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Monitors are much sought after by scrap dealers as they contain good quantity of copper yoke, besides circuit board and picture tube. The different recovery processes observed are given below:

### Disassembling of CRT and Extraction of Components

The first step in monitor recycling involves physical removal of plastic casing, picture tube (cathode ray tube), copper yoke and plates.

The intact and functional CRT is used for the manufacture of colour and black & white television for local brands. Re-gunning is possible only for those monitors whose terminal pin (diode pin) of electron gun has not broken in the process of removing yoke from gun. The process of re-gunning of CRT is only done at Delhi.

## Recovery of Glass from CRT

Defective CRT is broken down to recover iron frames from the glass funnel as shown in Figure 4. The iron frames are found only in color CRTs and not in black & white monitors. The glasses and iron frames from picture tubes are given to waste traders.

**Figure 4: Glass Recovery by CRT Breaking**



## Yoke Core, Metallic Core and Copper from Transformers

The copper and yoke core recovered from yoke coils found around the picture tube end is sold to copper smelters and re-winders. Apart from the yoke, copper and metallic core is also recovered from transformers mounted on the circuit board of the computer. The circuit tray also contains a number of condensers of different sizes. Depending upon their condition and demand they again enter into the secondary market for reuse. If they are defective, they are sold along with the motherboard.

## Rare Earth Core of Transformer and Copper

These small transistors and rare earth transformers are boiled in water with small amount of caustic soda, which results in loosening of joint between the core resulting in core and copper extraction.

## 3. Copper Extraction from Wires

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Two kinds of processes are being followed under this category as listed below:

- I. Manual drawing of wires for copper
- II. Extraction of copper by burning the wire

### I. Manual drawing of Wires for Copper

Under this process with the use of knife the edge of wire is cut and then with the help of pliers the copper is extracted from PVC. And then the copper goes for sale to copper smelters and PVC is used for plastic graining.

### II. Extraction of copper by burning the wire

In this process simple open burning leads to emission of various toxic gases in the air, which is one of the significant factor of air pollution.

## 4. Plastic Shredding and Graining

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The plastic casings of monitors are made either of PVC (polyvinyl chloride) or ABS (Acrylonitrile-butadiene styrene). PVC was used more commonly in the early models of computers. Now computer-manufacturing companies have shifted to ABS plastic in the production of monitors. Though both types of plastics are currently being recycled, the PVC one cannot be recycled. This is due to the high percentage of silicate being added for making it fire retardant. The silicate plastic often ends up at kilns as an alternate source of energy. The plastic casing is recycled into High Impact Plastic. These kinds of plastics are frequently used in manufacturing toys.

## 5. Dismantling of Refrigerator & segregation of compressor and cooling box

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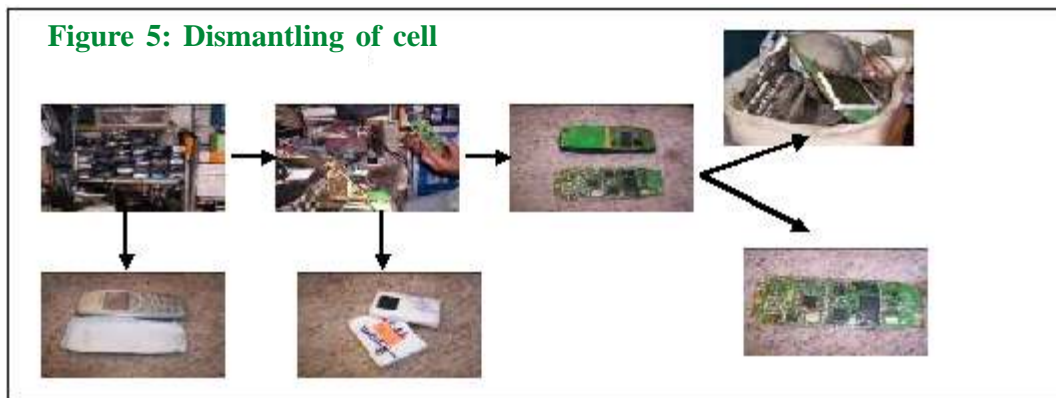
Refrigerator is dismantled for metal recovery, plastic recovery, insulating material and compressor which is sold to vendors.

## 6. Dismantling of cell phone

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Cell phone is dismantled for plastic recovery, battery, LCD screen, PWB/PCB as shown in Figure 5.

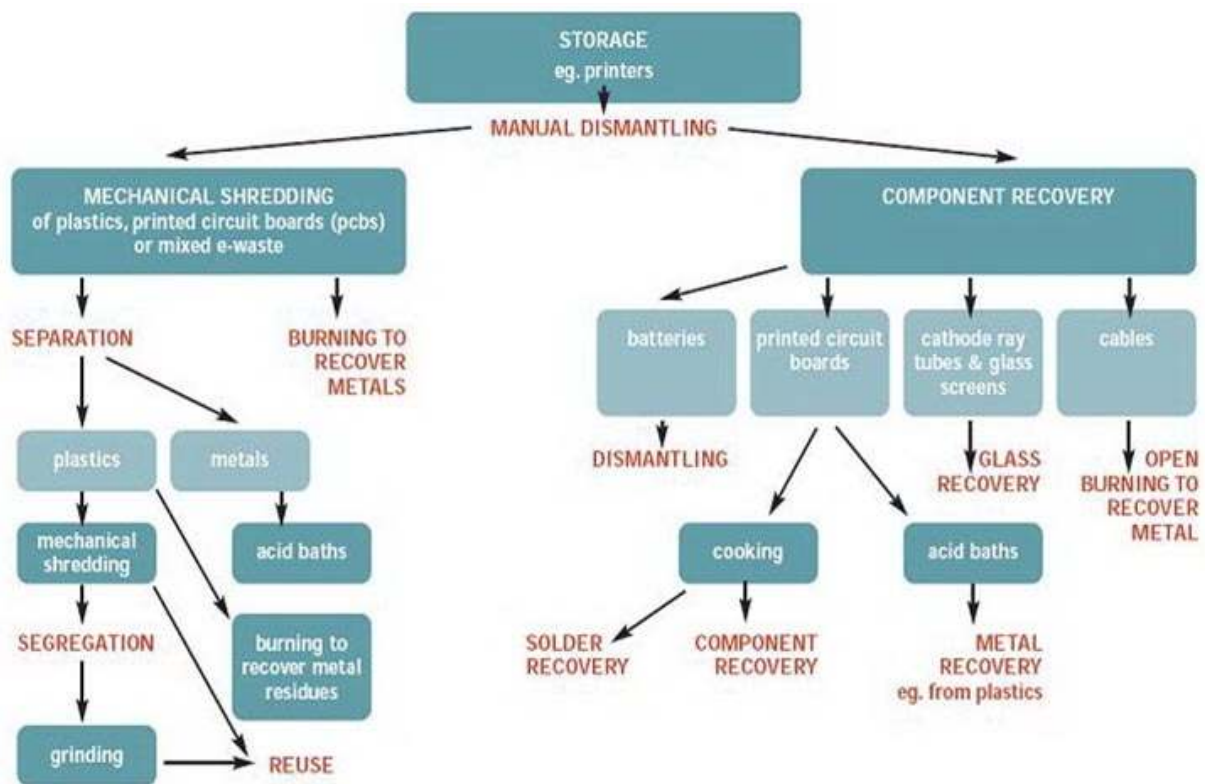




## Recycling of e-waste

The figure shows the whole process of recycling of e-waste in unorganized way which is one of the worst thing for the ecosystem and human health.

**Figure 6: Recycling of e-waste**



## Ranking of the Electronics Companies

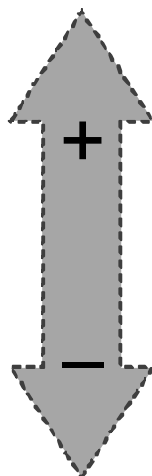
GREENPEACE had first released 'Guide to Greener Electronics' in August 2006. The guide ranks the 17 top manufacturers of personal computers, mobile phones, TV's and games consoles according to their policies on toxic chemicals, recycling and climate change.

### Ranking criteria

The ranking criteria reflect the demands of the Toxic Tech campaign to the electronics companies. The three demands are that companies should:

- Clean up their products by eliminating hazardous substances;
- Take back and recycle their products responsibly once they become obsolete; and
- Reduce the climate impacts of their operations and products.

1. Nokia
2. Samsung
3. Sony Ericsson
4. Philips
5. Sony
6. LG Electronics
7. Toshiba
8. Motorola
9. Sharp
10. Apple
11. Acer
12. Panasonic
13. Dell
14. Lenovo
15. Microsoft
16. HP
17. Nintendo



Nokia scores maximum points for its comprehensive voluntary take-back programme, which spans 84 countries providing almost 5,000 collection points for end-of-life mobile phones. It now also scores top marks for the information it provides to customers on what to do with their discarded products.

## Suggestions

1. Impart training to generators on e-waste handling.
2. Awareness program on e-waste for school children and general public.
3. Fix duties and responsibilities to recyclers.
4. Design a Product with ingredient in an electronic product in such way that the quantity toxic element like cadmium, antimony, lead etc. should be bare minimum.
5. To make recycling business viable one, Government should ;
  - a. Subsidize recycling and disposal industry.
  - b. Introduce incentive schemes for garbage collectors, general public for handling over e-waste.
  - c. Impose disposal fee from manufacturers and consumers.
  - d. Promote recycling units to ease process and to encourage generators to have proper e-waste disposal.
  - e. Reward and reprimand schemes for performance and non-compliance of e-waste management.

## LIST OF THE UNITS REGISTERED WITH MOEF/CPCB AS RECYCLERS/REPROCESSORS HAVING ENVIRONMENTALLY SOUND MANAGEMENT FACILITIES FOR E-WASTE

Sr.No.	Name	Address of Recyclers/Reprocessors of E-waste
1.	M/s Earth Sense Recycle Private Limited	Plot No.37, APIIC Industrial Park Mankhal, Maheshwaram Mandal Rangareddy Distt. Andhra Pradesh
2.	M/s Earth Sense Recycle Pvt. Ltd.	Plot No.225, Sector-VI IMT Manesar, Gurgaon Haryana-122 051
3.	M/s K.G. Nandani Enterprises	#46/4, 46/5, Billakempanahalli Village Bidadi Hobli, Ramnagar(Tauk & District) Pin – 562 109 Karnataka State

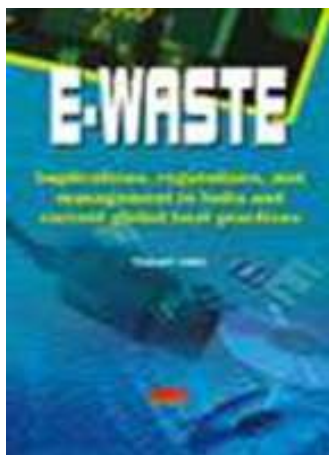
4.	M/s E-Parisara Pvt. Ltd.	Plot No.30-P3 KIADB Industrial Area, Dabaspeta Nelamangala Taluk Bangalore Rural District-562 111
5.	M/s Eco Recycling Limited	26, Chandivali Village Road Off.Saki Vihar Road Andheri(E) Mumbai-400 072, Maharashtra
6.	M/s Attero Recycling Pvt.Ltd.	173, Village Bhagwanpur Raipur Industrial Area Roorkee Distt. Haridwa Uttarakhand

## References

[www.elcia.in](http://www.elcia.in)                      [www.e-waste.in](http://www.e-waste.in)  
[www.cpcb.nic.in](http://www.cpcb.nic.in)                [www.maharashtra.gov.in](http://www.maharashtra.gov.in)  
[www.greenpeace.org](http://www.greenpeace.org)        [www.cleanworld.co.in](http://www.cleanworld.co.in)  
[www.toxicslink.org](http://www.toxicslink.org)

## BOOK REVIEW

### E-waste: Implications, regulations, and management in India and current global best practices by Rakesh Johri



#### Description

E-waste is among the fastest growing waste streams across the world today, with its growth fuelled by exponential growth in the use of electronic equipment, especially PCs (personal computers), and their rapid rate of obsolescence. The disposal of e-waste is a major problem because of the presence of toxic elements such as lead, mercury, and cadmium. The backyard recycling operations are mostly rudimentary in nature, causing extensive damage to both the environment and human health. Therefore, there is an urgent need to adopt an environment-friendly and simple technology for recycling these wastes. There is also a need to create awareness among stakeholders, including workers involved in e-waste recycling units. The book addresses these issues and also covers international best practices and regulations on e-waste.

#### More Details

Published by : The Energy and Resources Institute (TERI), New Delhi  
**ISBN 9788179931530**

## Government of Gujarat Resolution

For sustainable development, it is necessary to introduce substantial changes in the working and practices of the industries. With this view Government of Gujarat has decided to introduce incentive schemes for encouraging green practices for industries.

The Industrial Policy 2009 of State Government of Gujarat includes incentive schemes for assistance to environment protection and measures declared vide Government Resolution No. BGT/1008/499(1) & Government Resolution No. BGT/1008/499(2) declared on 11/6/09. For downloading this GR's visit the website [www.ic.gujarat.gov.in](http://www.ic.gujarat.gov.in)

# “E-Waste Management in India A Sustainable Solution”

Other Electronic equipments like iPod, DVD players, etc have also entered into secondary market for reuse.



Cell phone is dismantled for plastic recovery, battery, LCD screen & PCB.



Monitor recycling involves physical removal of casing, cathode ray tube & copper yoke



Refrigerator is dismantled for metal recovery, plastic recovery, insulating material and compressor.



Preheating of PCB is applied to recover resalable components like ICs, condensers, bearings (pulleys) from floppy drive and hard drive. Gold pins are recovered from PCB manually.

## Don'ts

- Don't dump e-waste with other types of waste.
- Don't aim at making money out of your e-waste; just cover the costs for storage and disposal.
- Don't expect others to take care of your waste, only you are responsible for where it goes.
- Do not break or grind e-waste, especially computer monitors, television sets, or other video display devices
- Take all precautions to avoid dropping e-waste, especially monitors, televisions and other video display devices. This includes working on a strong, flat surface and refraining from lifting heavy objects.
- Do not burn or weld e-waste.

## Do's

- Re-use a maximum of your equipment onsite.
- Inform employees about e-waste and its treatment and encourage them to dispose of e-waste through environmentally sound manner.
- Define a e-waste management policy for company.
- Adopt a green purchase policy, e.g. buy from brands providing a take back service.
- Give or sell e-waste to authorized recyclers only (!) and audit the recycler, or make sure it has been done by a relevant institution.
- Handle e-waste with safety and precautions.

We would appreciate if you send your comments & suggestions

Er. Bharat Jain, Member Secretary

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We would appreciate if you send your comments & suggestions to Er. Bharat Jain, Member Secretary, GCPC

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