

A STUDY ON MARKET SURVEY OF RE-USABLE e-PRODUCTS AND RECYCLED e-COMPONENTS

March 2014



Funded by
Department of Forest Ecology and Environment,
Government of Karnataka

Prepared by
Environmental Management and Policy Research Institute
Bangalore

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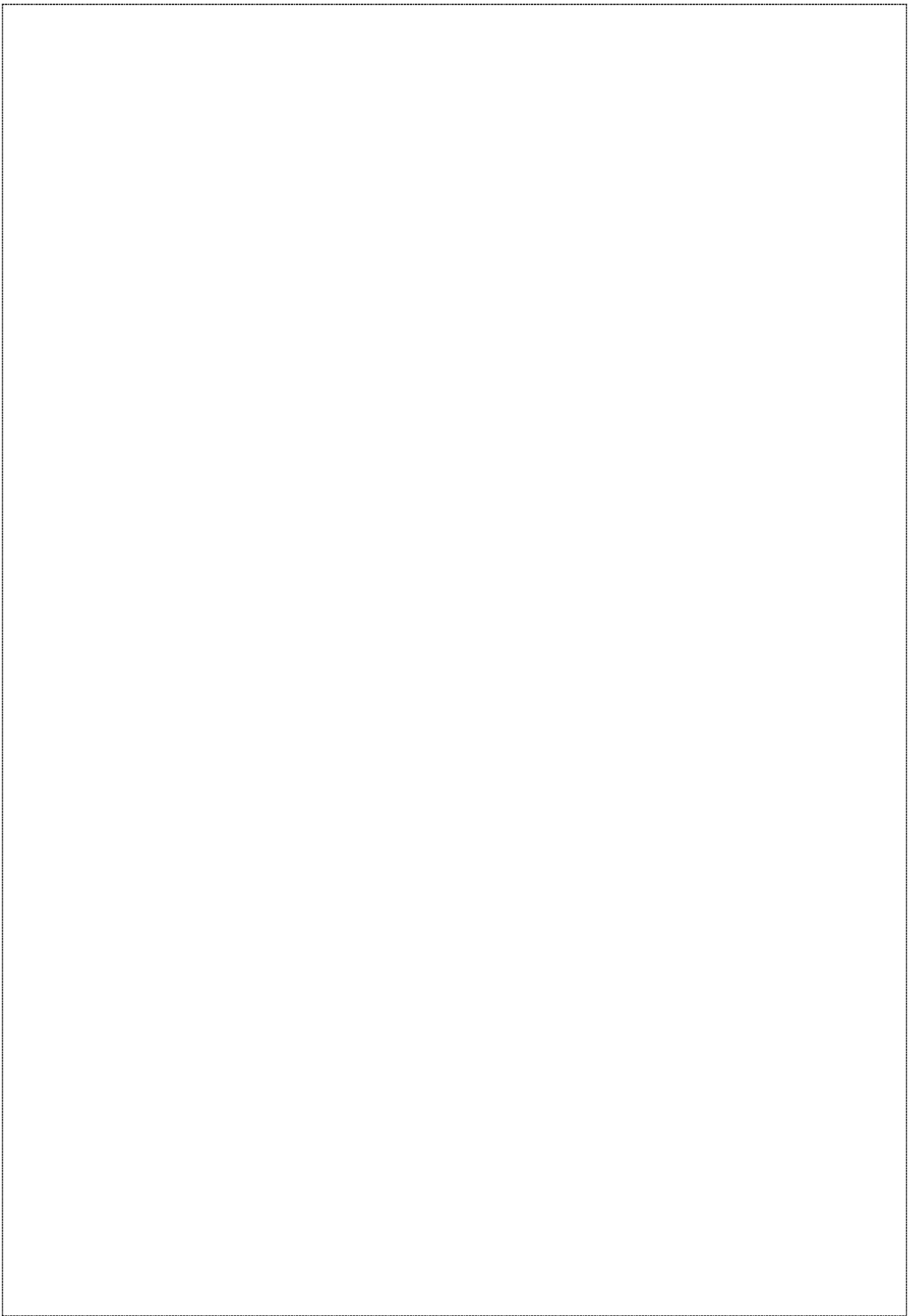
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**Environmental Management and Policy Research Institute (EMPRI)
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Government of Karnataka**



FOREWARD



Bangalore has emerged not only as the Silicon Valley of India but also as one of the top I T destinations in the world. However, beneath the glamorous surface of the benefits and the wealth created by the Information Technology revolution looms a darker reality. The growing quantity of waste from electronic industry, known as e-waste is beginning to reach disastrous proportions.

E-waste contains significant quantities of hazardous waste, including lead, mercury and cadmium. Improper recycling and disposal operations found in different cities of India often involve the open burning of plastic waste, exposure to toxic solders, river dumping of acids and widespread general dumping. As a result, pollutants are dumped into land, air and water. This is the method used by informal recyclers. Hence, converting them to formal recyclers is the need of the hour.

Centre for Waste Management, EMPRI has made an excellent attempt to do a study on Market Survey of Re-usable e-products and Re-cycled e-components. It has also identified the barriers the informal sectors face if they try to enter the formal sector. Finally, it has suggested a business model for setting up a formal e-waste recycling unit.

In the introduction of the study the EMPRI team has given an overview of Electronic Industry, followed by a detailed discussion on national and international legal provisions of e-waste management.

Then they have described the methodology adopted and done detailed analysis of the data collected by them. They have consulted a large number of stakeholders, prepared questionnaires specific to each category of stakeholders, they have undertaken a large number of field studies and as a result they have been able to bring about a high quality, forward looking report. The solutions to various problems suggested in the report may bring about a positive change if implemented.

I congratulate the EMPRI team which mainly consisted of Ms. Bijaylakshmi Borpuzari supported by Mr. Pran Raju and Mr. Girish K.M. and the NGO SAHAS for bringing out such an outstanding document.

Bangalore
15.03.2014

(RituKakkar)
Director General
E M P R I

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We are grateful to Ms. Sonali Singh for proof-editing the report.

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ACRONYMS, ABBREVIATIONS, UNITS AND DEFINITIONS

A

| | |
|----------|--|
| A.C. | Air conditioning |
| ASSOCHAM | Associated Chambers of Commerce and Industry |

B

| | |
|------|----------------------------------|
| BAN | Basel Action Network |
| BEL | Bharat Electronic Limited |
| BHEL | Bharat Heavy Electricals Limited |
| BPO | Business Process Outsourcing |
| BSNL | Bharat Sanchar Nigam Limited |
| BT | Biotechnology |

C

| | |
|------|---------------------------------|
| CAGR | Compound Annual Growth Rate |
| CFL | Compact Fluorescent Lamp |
| COP | Conference of Parties |
| CPCB | Central Pollution Control Board |
| CPU | Central Processing Unit |
| CRT | Cathode Ray Tube |

D

| | |
|------|---|
| DFEE | Department of Forest, Ecology and Environment |
|------|---|

E

| | |
|-------|--|
| EEE | Electrical and Electronic Equipment |
| EMPRI | Environmental Management and Policy Research Institute |
| EPA | Environmental Protection Act |
| EPA | Environment Protection Act |
| EPR | Extended Producer Responsibility |
| EU | European Union |

F

| | |
|----|----------------|
| FY | Financial Year |
|----|----------------|

G

| | |
|-----|-------------------------|
| GO | Government Order |
| GOI | Government of India |
| GOK | Government of Karnataka |

H

| | |
|-----|-----------------------------|
| HCL | Hindustan Computers Limited |
| HP | Hewlett Packard |
| HWM | Hazardous Wastes Management |

I

| | |
|-------|---|
| IBM | International Business Machines |
| ICRA | Investment information and Credit Rating Agency |
| IFB | Indian Fine Blanks |
| IMaCS | ICRA Management Consulting Services Limited |
| IMRB | Indian Market Research Bureau |
| IOC | Indian Oil Corporation |
| IT | Information Technology |
| ITPB | International Tech Park Bangalore |

K

| | |
|-------|--|
| KG | Kilo Grams |
| KIADB | Karnataka Industrial Areas Development Board |
| KSPCB | Karnataka State Pollution Control Board |

L

| | |
|-----|------------------------|
| LCD | Liquid Crystal Display |
| LED | Light Emitting Diode |
| LED | Light-Emitting Diode |

M

| | |
|------|---|
| M | Month |
| MAIT | Manufacturers Association for Industrial Technology |
| MoEF | Ministry of Forest, Ecology and Environment |
| MoU | Memorandum of Understanding |
| MSTC | Metal Scrap Trade Corporation |
| MT | Metric Tons |
| MT/A | Metric Tons/Annum |

N

| | |
|------|--|
| NEA | National Environment Agency |
| NMCC | National Manufacturing Competitiveness Council |

O

| | |
|------|---|
| OECD | Organisation for Economic Co-operation and Development. |
|------|---|

P

| | |
|-------|------------------------|
| PC | Personal Computer |
| PCB's | Printed Circuit Boards |

R

| | |
|------|-------------------------------------|
| RoHS | Restriction on Hazardous Substances |
|------|-------------------------------------|

S

| | |
|-----------|------------------------------------|
| S.P. ROAD | Sardar Patrappa road |
| SMPS | Switched-Mode Power Supply |
| SPCB | State Pollution Control Board |
| STPI | Software Technology Parks of India |

T

| | |
|------|---|
| T.V. | Television |
| TSDf | Treatment, Storage, and Disposal Facility |

U

| | |
|------|--|
| UEEE | Used Electronic and Electrical Equipment |
| UN | United Nations |
| UPS | Uninterruptible Power Supply |

W

| | |
|------|---|
| WEEE | Waste Electrical and Electronic Equipment |
|------|---|

DEFINITIONS

| | |
|-------------|---|
| Dismantling | Removal of parts that contains dangerous substances (CFCs, Hg switches, PCB); removal of easily accessible parts containing valuable substances (cable containing copper, steel, iron, precious metal containing parts, e.g. contacts). |
| Disposal | Means deposit, treatment, recycling and recovery of any hazardous wastes. |
| e-products: | Those products which enters market after being manufactured and are ready for its first use. |

| | |
|------------------------|---|
| e-Waste: | Means waste electrical and electronic equipment, whole or in part listed in schedule-I and scraps or rejects from their manufacturing and repair process, which are intended to be discarded. |
| Formal sector: | Sector which encompasses all jobs with normal hours and regular wages, and are recognized as income sources on which income taxes must be paid. |
| Hazardous waste: | Waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or likely to cause danger to health or environment. |
| Informal sector: | is that part of sector that is not taxed, not monitored by any form of government nor included in any gross national product (GNP) |
| Private Sector: | The sector which is run by private individuals or groups, usually as a means of enterprise for profit, and is not controlled by the state. |
| Public sector: | Refers to the part of the economy concerned with providing basic government services. |
| Recovery: | Means to any operation in the recycling activity where in specific materials are recovered |
| Recycled e-components: | Those components of e-products which are reclaimed after recycling of e-waste. |
| Recycler: | Means an occupier who procures and processes hazardous materials for recovery. |
| Recycling: | Means reclamation and reprocessing of hazardous materials from a production process in an environmentally sound manner for the original purpose or for other purposes. |
| Reduce: | Minimal use of e-products |
| Repair: | Restoring damaged parts of an e-product to a good condition either by replacing the product or repairing some of its components. |

Retail: is the sale of goods and services from individuals or businesses to the end-user.

Re-usable e-products: Those e-products which are reused again after its longevity period.

Re-use: Means hazardous materials that are used for the purpose for its original use or another use.

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EXECUTIVE SUMMARY

Our report, Market Survey of Reusable and Recycled e-products looks at how e-Waste is a source of raw material which can and should be put back into manufacturing. More so, the life of components /equipments can be extended through retrieval and repair. The report is based on studies carried out in Bangalore and tracks the generation of e-Waste, its flow, processes used for retrieval and recycling and its impact on environment and livelihood.

The report includes findings of survey carried out with government departments, producers, large bulk waste generators, the retail sector, recyclers and small enterprises involved in supporting repair and refurbishment systems.

Attempts are made to document the flow of e-Waste from generator to the recycler. As observed from KSPCB records in January 2014, there are 34 authorised recyclers who collectively have a capacity to recycle 37,000 metric tonnes per annum (MT/A).

Although recycling business of e-waste is attractive business but only small enterprises with capacity to dismantle, retrieve and recycle 1 tonnes per day, are thriving well. Formal enterprises are not doing well, as they do not receive adequate e-waste quantity. The investment required for 300 MT capacity enterprises is estimated to be Rs 40 Lakhs and a breakeven is achieved in 8 months if the plant runs to full capacity. In Bangalore 5 recyclers with informal origins have enthusiastically opted to move to authorized recycling. However all these units unsustainable for want of e-Waste from bulk generators.

The report looks in detail at inefficient collection systems employed which results in e-Waste slipping into the informal sector, who are not authorized to carry out dismantling and recycling activities.

The informal sector has lower overheads in terms of operating costs and consequently offers better prices for the e-Waste. Although this sector, by now, should have become irrelevant; but it continues to thrive because bulk generators, for monetary gains blatantly use unauthorized recyclers for disposal of their e-Waste.

Large chunk of e-Waste from bulk generators is auctioned through professional auctioneers like Matex and MSTC (Metal Scrap Trading Corporation). These auction companies are yet to introduce comprehensive policies and do not debar unauthorized recyclers from participating in auction and succeed in getting lots where e-Waste is mixed with other wastes. However, unauthorised recyclers are prevented to participate in auction of exclusive lots of e-waste.

On the other hand, the government departments generating huge volumes of e-Waste every year are also unaware about the new e-Waste rules. They have been slow in actually developing a mechanism to ensure that the buy-back policies, which they currently adopt, do not allow their e-Waste to go into the informal sector. This report has suggested instructions to be issued from the regulatory authority in the form of a circular stating that all departments must follow e-Waste Rules Guidelines 2012 and dispose-off their waste only to authorized recyclers.

Another problem is with the retail sector that encourages customers to exchange their old equipment for new products. e-Waste collected during such exchange offers are seen to be going through vendors to the informal sector.

The report brings out serious violations and failures to comply with the e-Waste Management and Handling Rules 2012. India has impressive legislation, especially with regards to environment laws. This has wide acceptance both in India and across the world.

The problem is in the enforcement of the law and our inability to implement laws and make them work on the ground.

The new e-waste rules itself are comprehensive. Different stakeholders in the form of the government, producers, bulk waste generators, recyclers and the domestic sector are recognized. Specific roles and responsibilities are assigned to each of the stakeholders.

The government bodies are responsible for ensuring compliance to the rules, tracking the quantities of e-Waste generated and the capacity developed for safe recycling. Attempts has been made to estimate the number of IT equipments (including laptops, desktops, printers, UPS) which will be considered as e-waste and which needs to move out of the Departments as an e-waste after five years from its date of procurement. The figures for 2011-12 came out to be around 90,000 of IT equipments (including laptops, desktops, printers, UPS. However, even after a lapse of two years the actual quantity of waste that the state as a whole generated in 2011-12 could not be tracked.

From the records of KSPCB in January 2014, we were able to estimate only the e- Waste generated by 533 registered industries involved in the manufacture of hazardous waste. There is no consolidated data available for e-Waste generated by the other generators.

Estimates from even such a small sector like the hazardous waste industry in Karnataka registered under KSPCB indicate a huge volume of e-Waste (43,000 metric tonnes per annum). When this estimated quantity is extrapolated covering other bulk consumers (such as Govt. depts., banks, private firms, commercial establishments, etc.) the figure showed 86,118 MT/A. The collective capacity of 34 authorised recyclers in Karnataka in 2012-13 is estimated to be 37,000 MT/A. This is less than what 533 registered industries alone generate.

There is therefore an obvious deficit in recycling capacities. What is therefore inexplicable is the fact that authorized recyclers continue to operate at 10% capacity, simply because they are unable to get material flowing to their units. The report does identify many gaps that need to be addressed, if the new e-Waste rules are to be implemented meaningfully.

It is strange to note why are bulk waste generators including government departments and retail show rooms are held not accountable for the e-Waste generated by them? Why are auction companies not penalized for their failure to enforce the rules? These questions need to be seriously addressed.

It has been observed that, the recyclers struggle to get e-Waste so as to make their business viable. It is also seen that they themselves are blatantly violating mandatory compliances. Authorized recyclers are required to file annual returns every year, which are generally not complied. There are no instances where no action is taken on account of these violations.

The records available with the KSPCB indicate that, only 14 out of 34 authorised e-waste recycling units have submitted their annual report.

The report also raises questions as to why after two years, producers have not shown any real interest to fulfil their Extended Producer Responsibility, where they are expected to introduce a reverse logistics system for take back of end of life products from all their customers.

The rules were introduced after comprehensive meetings and discussions with all the stakeholders including government, corporate sector, retail trade, households etc. Hopefully this report, which includes recommendations on the way forward, will be useful for government, and other stakeholders such as bulk waste generators, the retail sector and even the individual consumer.

1. ELECTRONIC INDUSTRY-AN OVERVIEW

Today, the electronic industry is the world's largest and fastest growing manufacturing industry. In 2013 the industry was expected to touch a total turnover of \$1.774 trillion which is close to the revenue generated by automobile industry (\$2 trillion). The product of the electronics industry such as mobile phones, TVs, PCs, etc. account for only 53% of the electronics industry. The remaining is accounted for by embedded electronics in transport (cars, planes, trains, etc.), defence and manufacturing equipment. It is also seen that the production base of electronic equipment is shifting significantly towards the Asia Pacific region, where China and Japan are now world leaders.

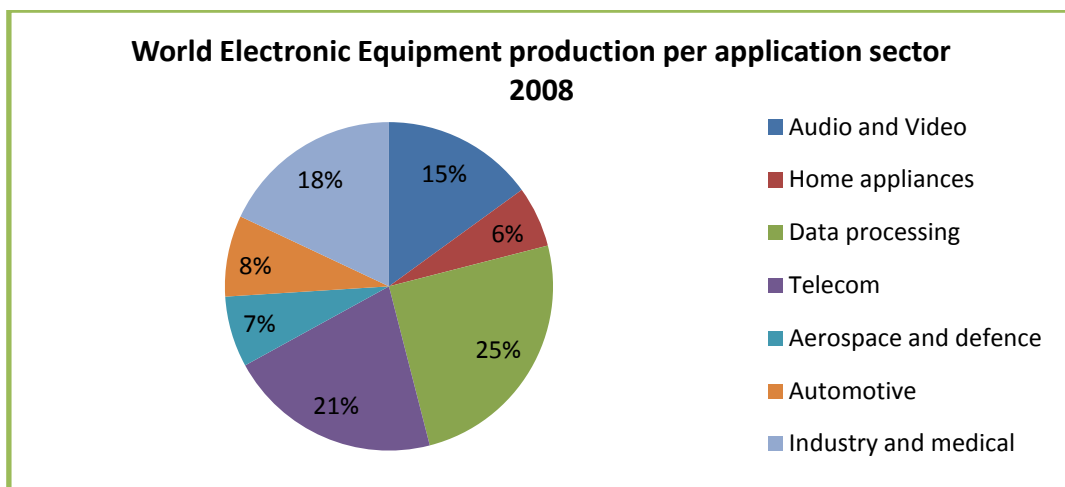


Figure 1 World Electronic Equipment production per application sector 2008

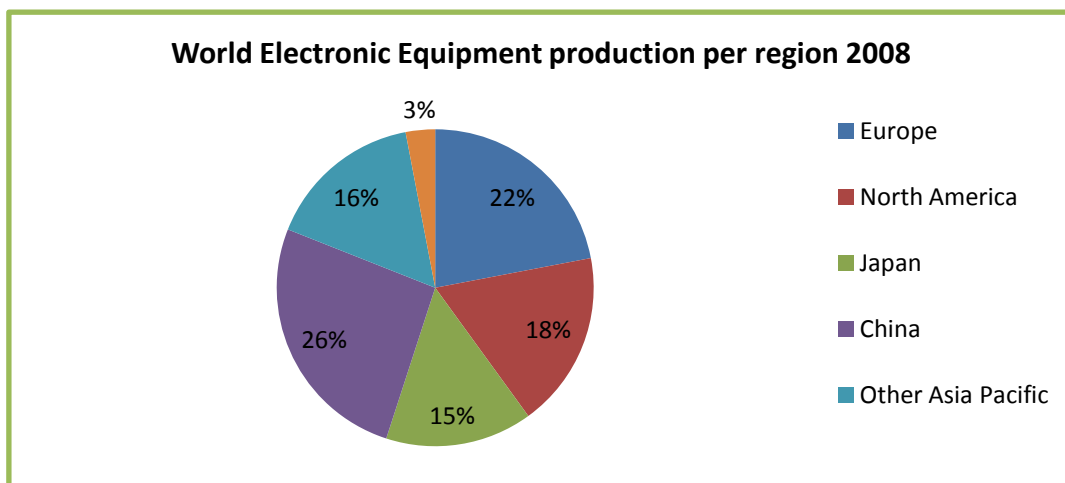


Figure 2 World Electronic Equipment production per region 2008

1.1. INDIAN ELECTRONIC INDUSTRY

Although at present, India's production constitute only about 1.3% of the global electronics hardware production, it is set to further increase at a rapid rate. In India, electronics and IT hardware industry comprise of six key segments: Consumer electronics, Industrial electronics, IT hardware/computer hardware, Telecommunication equipment, Electronic components and Strategic Electronics.

Table 1: Details on the structure of the six segments

| Electronic Industry | Products/ Items |
|--------------------------------|--|
| 1. Consumer electronics | CRT TVs, LEDs, LCDs, Audio and Video systems, washing machines, air conditioners and mixers etc |
| 2. IT hardware | Personal storage devices, printers, servers, Personal Computers (PCs), supercomputers, data processing equipment and peripherals such as monitors, keyboards, disk drives, SMPS, modems, networking products and add-on cards. |
| 3. Telecommunication Equipment | Digital exchanges (EPABX, RAX, TAX, and MAX), transmission equipment (HF/VHF/Microwave trans-receivers), satellite communication terminals, optical fibre communication equipment, two-way radio communication equipment. |
| 4. Electronic Components | TV picture tubes, monitor tubes, diodes and transistors, power devices, ICs, hybrid microcircuits, resistors, capacitors, connectors, switches, magnetic heads, DC micro motors and tape deck mechanism, printed circuit boards(PCBs), crystals, loudspeakers. |
| 5. Strategic Electronics | Satellite base communications, navigation and surveillance, underwater electronics and infra-red based detection, disaster management and GPS based vehicle tracking system. |
| 6. Industrial electronics | Process control instrumentation, electro-mechanical systems, Test and Measuring (T&M) instruments. |

Source: Ministry of Communications & Information Technology, Department of Electronics and Information Technology, Government of India

In terms of production, consumer electronics and telecom equipment dominate the industry, with 27% each.

Based on the National Skill Development Corporation report, an analysis made by IMAcS revealed that, telecommunications and IT hardware have increased their share in the industry in the recent times. They are the fastest growing segments with Compound Annual Growth Rate (CAGR) touching 21% for telecommunication equipment and 28 % for IT hardware.

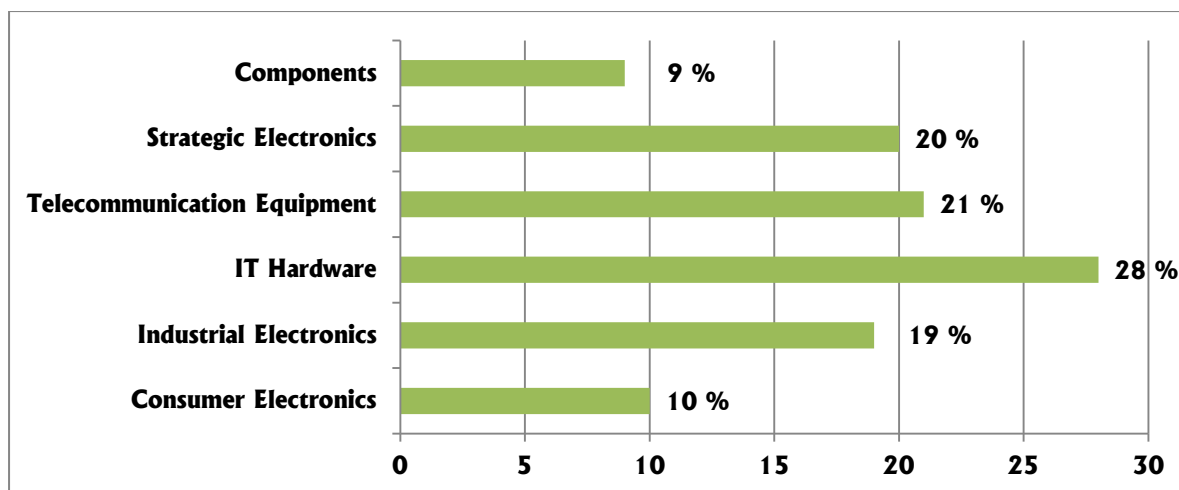


Figure 3 Growth rates CAGR of key segments for 2002-2008

The electronics industry in India had initially grown around three major centres, Bangalore, Mumbai/ Pune and Delhi. Bangalore not only has major public sector units in defence and telecommunication but also has a very fast-growing, organised private sector firms in computer and industrial products¹.

The overall production performance of various segments in electronics hardware and software and services sector in 2012-12 is illustrated below:

Table 2: Electronics & IT Production (Financial Year) (in crore)

| Item | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13* | Growth |
|--------------------------------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|--------|
| Consumer Electronics | 22,600 | 25,550 | 29,000 | 32,000 | 34,300 | 41,200 | 20% |
| Industrial Electronics | 11,910 | 2,740 | 15,160 | 17,000 | 18,700 | 21,500 | 15% |
| Computer Hardware | 15,870 | 13,490 | 14,970 | 14,970 | 16,500 | 24,300 | 47% |
| Communication & Broadcast Equipments | 18,700 | 26,600 | 31,000 | 35,400 | 40,500 | 55,000 | 35.8% |
| Strategic Electronics | 5,700 | 6,840 | 6,980 | 7,700 | 8,500 | 9,000 | 5.9% |
| Electronic Components | 9,630 | 12,040 | 13,610 | 21,800 | 24,800 | 26,500 | 7% |
| Sub Total (hardware) | 84,410 | 97,260 | 1,10,720 | 1,28,870 | 1,43,300 | 1,77,500 | ---- |

Source: Ministry of Communications & Information Technology, Department of Electronics and Information Technology, Government of India

IT hardware and telecommunication equipment had an incredible growth. It is mainly due to the changing lifestyles, higher incomes and greater affordability which play a major fuelling factor for this growth.

¹Source: Productivity & Competitiveness of Indian Manufacturing – IT Hardware & Electronics Sector, NMCC, GoI

Within IT hardware and the telecommunication segment, laptops, desktops, tablets, UPS and smart phones have made the largest contribution so far. A recent MAIT and Indian Market Research Bureau (IMRB) further endorses this trend.

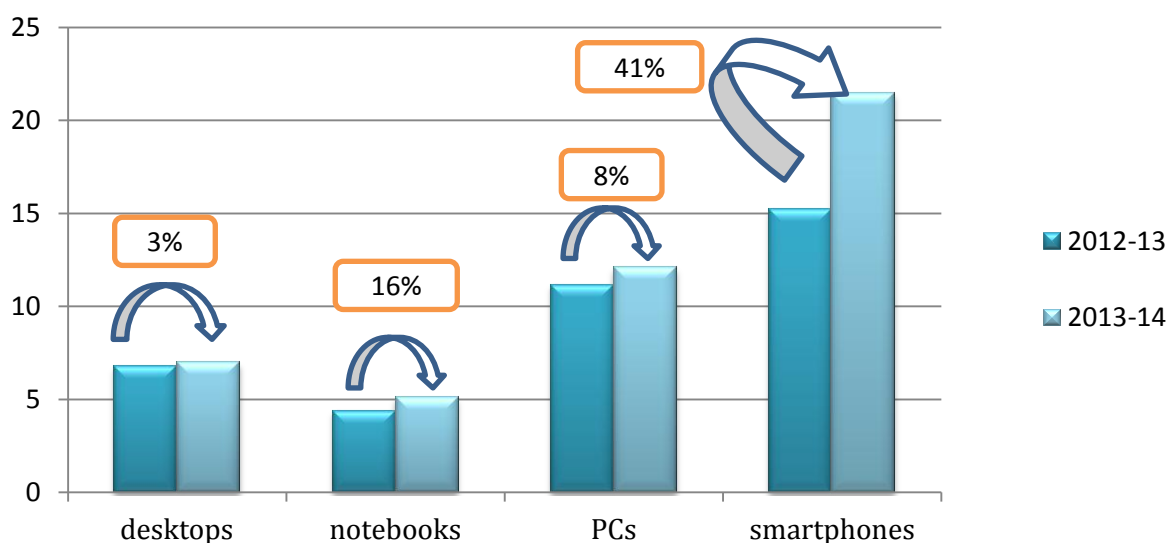


Figure 4: 1 Forecast for the total sales (in million), India

Source: MAIT

With the emerging trends, the consumer preferences have also shifted towards products and devices that come with smart technology, innovative designs and user-friendly features and are also aesthetically designed. This shows a high demand-supply chain for electronics in the Indian market.

Overall the electronic industry in India shows good potential in terms of growth, this however also means that the generation and management of e-Waste needs to keep pace with the growth of the industry.

Are we really ready for this?

It is fortunate that the government has introduced appropriate new legislation to regulate the collection and recycling of e-Waste. These regulations however will need effort and participation of the producers, generators and recyclers to ensure that e-Waste does not become a threat to our environment and health.

2. LEGAL PROVISION ON E-WASTE MANAGEMENT

2.1. ELECTRICAL AND ELECTRONIC EQUIPMENTS- AS E-WASTE

Waste Electrical and Electronic Equipment (WEEE) or e-Waste in short is the term used to describe old, end-of-life or discarded equipment and appliances that use electricity.

As per GoI, E-Waste means waste electrical and electronic equipment, whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded;

'Electrical and electronic equipment' means equipment which is dependent on electrical currents or electro-magnetic fields to be fully functional.

An increasing market penetration in developing countries, a replacement market in developed countries make e-Waste one of the fastest growing streams.

It has been estimated that about 40 million tonnes of e-Waste is produced every year; which is growing at a rate of 40% every year.

Today, most e-Waste is being discarded in the general waste stream. Currently, e-Waste accounts for 2 to 5 % of the total solid waste; however, it accounts for 70% of toxic waste worldwide.

E-Waste contains small but significant quantities of hazardous waste, including lead, mercury and cadmium. Subsequently, e-Waste is also considered as a mine of precious metals, for example computers, mobile phones and other electronic products use a staggering 320 tonnes of gold and more than 7500 tonnes of silver annually worldwide. About 17 precious and semi-precious metals can be extracted from e-Waste.

In general, the presence of recyclable and re-usable components in e-Waste has attracted many stakeholders like formal and informal sector to adopt unscientific methods to extract those components. The informal operations often involve the open burning of plastic waste, exposure to toxic solders, river dumping of acids and widespread general dumping, which leads to health and environmental pollution. Accordingly, the subject of electronic equipment disposal and recycling has drawn the attention of Government at all levels and has become the subject of discussion and debate between Government Organizations and the private sector manufacturers of computers and consumer electronic equipment. In order to understand the situation completely, let us have a look into the e-Waste legislations that are followed worldwide.

2.2. BASEL CONVENTION

Basel convention is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries (LDCs).The Convention was opened for signature on 22 March 1989, and entered into force on 5 May 1992. 181 parties have

signed the treaty. India signed the treaty on 15/03/1990 which was ratified on 24/06/1992.

The basic purpose of the Convention is to ensure that states are fully able to protect their own environment and rejects actions which might have adverse impact on the environment, such as a transboundary movement of hazardous waste. The Convention was designed to eliminate the risks arising from the Trans boundary movements of hazardous and other wastes. These risks include those arising from the transportation, handling, disposal and recycling of waste. The movements of such wastes from industrial to developing countries, was a matter of concern.

The process involved in the Convention requires a prior informed consent that must be followed before any export or import is allowed to or from another party. The Exporting State is obliged to get the written approval of the Importing state for such a movement to be legal under the Basel Convention. In this context, each party has the right to ban any import or export of hazardous or other wastes.

The BAN Amendment to the Convention was adopted at the Third Conference of the Parties in 1995 and incorporated in the text of the Convention. This amendment bans any export of hazardous wastes from Basel Convention Parties that are members of the EU, OECD, and Liechtenstein to all other Parties to the Convention. The eighth meeting of the Conference of the Parties (COP-8) held from 27 November to 1 December 2006, at the UN Office in Nairobi, Kenya, considered reports on activities within the Convention's mandate and adopted a declaration on e-Waste, in addition to, more than 30 decisions².

2.3. INTERNATIONAL LEGISLATION

It is interesting to also understand the development of specific legislation within various countries.

Table 3: e-Waste regulations in different countries³

| COUNTRY | REGULATION ADOPTED | YEAR | CORE POINTS |
|---------|--|------|--|
| China | i. Draft regulation on the management of electronic waste. | 2008 | i. This regulation is intended to promote the continued use of resources through recycling and to monitor the end-of-life treatment of electronics. Under the new regulations, recycling of electronics by the consumer is mandated. It also requires the recycling of unnecessary materials discarded in the manufacturing process. |

²http://en.wikipedia.org/wiki/Basel_Convention

<http://www.mfa.gov.tr/basel-convention-on-the-control-of-transboundary-movements-of-hazardous-wastes-and-their-disposal.en.mfa>

http://www.iisd.ca/process/chemical_management-baselintro.html

³Source: D. Sinha-Khetriwal et al. / Environmental Impact Assessment Review 25 (2005) 492-504- Switzerland. <http://app2.nea.gov.sg/docs/default-source/anti-pollution-radiation-protection/chemical-pollution/additional-hs-codes-for-e-Waste-and-used-electronic-equipment.pdf?sfvrsn=0>- Singapore

| COUNTRY | REGULATION ADOPTED | YEAR | CORE POINTS |
|--------------------|---|------|--|
| Europe | i. Waste Electrical and Electronic Equipment Directive (WEEE Directive) | 2002 | i. It was designed to make equipment manufacturers financially or physically responsible for their equipment at the end of its life, under a policy known as Extended producer responsibility (EPR). "Users of electrical and electronic equipment from private households should have the possibility of returning WEEE at least free of charge", and manufacturers must dispose of it in an environmentally friendly manner, by ecological disposal, reuse, or refurbishment. |
| | ii. Restriction of Hazardous Substances Directive (RoHS Directive) | 2003 | ii. This directive restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment. |
| Canada | Proposed Electrical and Electronic Equipment Stewardship Regulation and also The Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations | 2004 | i. It follows certain guidelines for disposal of e-Waste and also conveys to Basel convention. |
| USA | There is no federal mandate to recycle e-Waste; however, many states have instituted mandatory electronics recovery programs. Best example can be given as California. | | i. California was the first state to legislate around the issue of e-Waste. It implemented a broader waste ban, with advance recovery fee funding in 2003. Electronic waste in California may neither be disposed of in a landfill nor be exported overseas. The 2003 Electronic Waste Recycling Act in California introduced an Electronic Waste Recycling Fee on all new monitors and televisions sold to cover the cost of recycling. The fee ranges from six to ten dollars. California went from only a handful of recyclers to over 60 within the state and over 600 collection sites. |
| Singapore | No such defined regulation but it is considered under Basel convention. National Environment Agency has taken various recycling programmes. | | i. Various Take-Back Programmes have been initiated by suppliers such as Canon, Dell, HP, Toshiba, Nokia and Motorola to collect used computers, printers, ink and toner cartridges and telecommunications products for recycling. Used items can also be dropped off for donation, sold or exchanged at various collection centres. In spite of that, the export, import or transit waste requires a permit from the Pollution Control Department (PCD) of Singapore. |
| Switzerland | The Return, the Taking Back and the | 1998 | i. Switzerland is the first country in the world to have established a |

| COUNTRY | REGULATION ADOPTED | YEAR | CORE POINTS |
|---------|--|------|---|
| | Disposal of Electrical and Electronic Appliances | | formal system to manage e-Waste. The effective collection of e-Waste in Switzerland is primarily due to the efficient management of the waste stream by two Producer Responsibility Organisations (PROs)—SWICO and S.EN.S. Their e-Waste programs based on the principle of Extended Producer Responsibility (EPR). |

2.4. INDIAN LEGISLATION ON E-WASTE: BRIEF BACKGROUND

Until 2011, the regulation and issues related to e-Waste were covered by laws like Hazardous Waste (Management and Handling) Rules (HWM), 1989/2000/2003 and Directorate General of Foreign Trade Export-Import Policies.

The HWM Rules, 1989 made provisions for the control of generation, collection, treatment, transport, import, storage, and disposal of hazardous waste listed in the schedule annexed to these rules. In accordance to it, e-Waste which was also included as Hazardous Waste (HW) was also required to comply with these rules.

E-Waste however only becomes hazardous if the recycling and disposal of hazardous components within WEEE is not managed properly. Given this fact the HWM were seen to be unsuitable to regulate and manage e-Waste

In 2008, CPCB prepared guidelines for sound management of e-Waste. The rules were first drafted by NGOs, Industries and the government in 2011. The E-Waste (Management and Handling) Rules were thereafter notified and came into force for implementation in May 2012

The notified rules include concepts like Extended Producer Responsibility (EPR) and RoHS (Restriction on Hazardous Substances),

The rules empower the State Pollution Control Board (SPCBs) to take action as per the provisions of the Environmental Protection Act (EPA), 1986 in case of any violation. The rules comprise six chapters, three schedules and five forms.

Table 4: E-Waste management and handling rules 2011

| Chapter/Schedule/Forms | Contents |
|------------------------|---|
| Chapter1 | Has definition of various terms |
| Chapter2 | Responsibilities of the producers, collection centers, dismantlers, recyclers and bulk consumers. |
| Chapter3 | Procedure for seeking authorization and registration |
| Chapter 4 | Storage of e-Waste |
| Chapter 5 | RoHS |
| Chapter 6 | Duties of Regulatory authorities, annual report from producers, collection centers, dismantlers, recyclers, transportation , accident reporting |
| Schedule I | List of equipment |

| Chapter/Schedule/Forms | Contents |
|------------------------|--|
| Schedule II | Exemptions list for RoHS |
| Schedule III | Duties of regulatory authorities |
| Forms | Form1, Form2, Form3, Form 4 and Form 5 |

According to the rules, there are 22 terms/definitions. Some important terms are listed for quick reference:

- a. "Authorisation" means permission for handling, collection, reception, storage, transportation, dismantling, recycling, treatment and disposal of e-Waste.
- b. "Bulk consumer" means bulk users of electrical and electronic equipment such as central or state Government departments, public sector undertakings, banks, educational institutions, multinational organizations, international agencies, and private companies that are registered under the Factories Act 1948, Companies Act 1956, and the Micro, Small and Medium Enterprises Development Act, 2006.
- c. "Consumer" means any person(s) using electrical and electronic equipment excluding the bulk consumers.
- d. "Environmentally sound management of e-Waste" means taking all steps required to ensure that e-Waste is managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such wastes.
- e. "electrical and electronic equipment" means equipment which is dependent on electric currents or electro-magnetic fields to be fully functional including those used for the generation, transfer and measurement of such currents and fields falling under the categories set out in Schedule-I.
- f. "e-Waste" means waste electrical and electronic equipment, whole or in part listed in schedule-I and scraps or rejects from their manufacturing and repair process, which are intended to be discarded.
- g. "Extended Producer Responsibility (EPR)" means responsibility of any producer of electrical or electronic equipment, for their products beyond manufacturing until environmentally sound management of their end-of-life products.
- h. "Historical waste" means branded or non-branded or assembled EEE products whole or in parts, available on the date from which these rules come into force.
- i. "Orphaned products" means non-branded products or those produced by a company, which has closed its operations or has stopped product support.
- j. "Producer" means any person who, irrespective of the selling technique used;
 - i. Manufacturers and offers to sell electrical and electronic equipment under his own brand; or
 - ii. Offers to sell under his own brand ,assembled electrical and electronic equipment produced by other manufacturers or suppliers; or

- iii. Offers to sell imported electrical and electronic equipment;
- k. “Recycler” means any person who is engaged in processing e-Waste for recovery of useful material or reuse.
- l. “Transporter” means a person engaged in the off-site transportation of e-Waste by air, rail, road or water.

The rules include a comprehensive set of responsibilities to various stakeholders and implementation systems

“The Producer(s) shall be responsible for obtaining authorization by filling application of Form 1 (**ANNEXURE-I**) from SPCB for maintaining records in Form-2 (**ANNEXURE-II**) of the e-Waste handled and such records should be made available for scrutiny by the appropriate authority whenever required and then to file annual returns in Form-3 (**ANNEXURE-III**) to SPCB/PCC on or before 30th day of June following the financial year to which that return relates.” In addition to that, following other responsibilities are also underlined for producers:

- a. Collection of e-Waste for safe recycling from its generation to the end-of-life of the product.
- b. Comply with Extended Producer Responsibility (EPR) and channelization of e-Waste, generated during manufacturing of electrical and electronic equipment to authorized dismantlers or recyclers.
- c. Comply with the ROHS - Restriction in use of hazardous substances including lead, cadmium, mercury, PBB, PPD, and Hexavalent Chromium.
- d. Give information on concentration level of hazardous substances like Lead, Cadmium, Mercury, PBB and PBD etc
- e. Provide booklets with all relevant information with the product.

The Collection centre(s) shall obtain an authorization by filing Form 1 from SPCB or PCC and ensure that the e-Waste collected by them is stored in a secured manner and later has to send to registered dismantler(s), or recycler(s) within a span of time of 180 days. They have to maintain records in Form-2 and also have to file annual returns in Form-3 to the concerned SPCB/PCC on or before 30th day of June following to the financial year to which that return relates.

The Consumer(s) or bulk consumer(s) shall ensure that e-Waste are channelized to authorized collection centers or registered dismantlers or recyclers or avail pick-up or take-back services provided by producers. Bulk consumers also have to maintain records of e-Waste generated by them in Form-2 and make such records available for scrutiny by SPCB or PCC concerned.

The Dismantler(s) shall register themselves by making an application in Form - 4(**ANNEXURE-IV**) and shall obtain an authorization by filing Form 1 from SPCB or PCC. They shall ensure that there is no damage caused to environment during the storage and transportation of e-Waste, the facility and dismantling processes are in accordance with the standards of guidelines published by CPCB from time to time, and the dismantled and segregated products are sent to registered recycling facilities for recovery of metals. Non-recyclable/ non-recoverable components should be sent to authorized treatment storage and disposal facilities. They shall also ensure not to process e-Waste or refine materials, unless they are registered from SPCB/PCC for the same. The dismantler(s) also has to file annual returns in Form-3 to SPCB or PCC or before 30th day of June following to the financial year to which that return relates.

The Recycler(s) shall register themselves by making an application in Form -4 and shall obtain an authorization by filing Form 1 from SPCB or PCC. They shall ensure that, the facility and recycling processes are in accordance with the standards of guidelines published by CPCB from time to time and the residue generated thereof is disposed in a hazardous waste treatment storage disposal facility. They also shall make available all records to CPCB or PCC for inspection.

The SPCB/PCC later has to submit all details such as number of registered units, category of wastes collected along with their quantities by the units etc. in Form-5(**ANNEXURE-V**) to the Central Pollution Control Board.

Under the e-Waste rules, in case of non-compliance with any of the conditions of the authorization or with any provision of the act or the rules, the SPCB/PCC may cancel or suspend the authorization issued under these rules for such period as it considers necessary in the public interest. The SPCB or PCC may also give directions to the persons whose authorization has been suspended or cancelled for same storage of the e-Waste and such persons shall comply with such directions.

Table 5: Categories of electrical and electronic equipment covered under the rules

| Sl. No | Categories of electrical and electronic equipment |
|--------|--|
| i. | Information technology and telecommunication equipment: <ul style="list-style-type: none"> i. Centralized data processing: ii. Mainframes, Minicomputers iii. Personal computing: iv. Personal Computers(Central Processing Unit with input and output devices) v. Laptop Computers (Central Processing Unit with input and output devices) vi. Notebook computers vii. Printers including cartridges viii. Copying equipment ix. Electrical and electronic typewriters x. User terminal and systems |

| Sl. No | Categories of electrical and electronic equipment |
|--------|---|
| | xi. Facsimile xii. Telex xiii. Telephones xiv. Pay telephones xv. Cordless telephones xvi. Cellular phones xvii. Answering systems |
| ii. | Consumer electrical and electronics: Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology), refrigerator, Washing machine, Air-conditioners excluding air conditioning plants |

According to the rules, the list of authorities and corresponding duties has been illustrated in the below:

Table 6: Corresponding duties against the authority

| Sl. No | Authority | Corresponding duties |
|--------|---|---|
| 1. | Central Pollution Control Board, Delhi | Coordination with SCPCB /PCCs of Union territories Preparation of guidelines for environmentally sound management of e-Waste Conduct assessment of e-Waste generation and processing Recommend standards and specifications for processing and recycling e-Waste. Documentation, compilation of data on e-Waste and uploading on websites of CPCB Conducting training and awareness programmes. Submit annual report to the Ministry Any other function delegated by the Ministry under these rules. Enforcement of provisions regarding reduction in use of hazardous substances in manufacture of electrical and electronic equipment Initiatives for IT industry for reducing hazardous substances Set targets for compliance to the reduction in use of hazardous substance in manufacture of electrical and electronic equipment Incentives and certification for green design/products |
| 2 | State Pollution Control Boards/ Committees of Union territories | Inventorization of e-Waste Grant and renewal of authorization Registration of recyclers of e-Waste Monitoring compliance of authorization and registration conditions Maintain information on the conditions imposed for authorization etc. Implementation of programmes to encourage environmentally sound recycling Action against violation of these rules Any other function delegated by the Ministry under these rules. |
| 3. | Urban Local Bodies (Municipal | i. To ensure that e-Waste if found to be mixed with Municipal Solid Waste is properly segregated, |

| Sl. No | Authority | Corresponding duties |
|--------|--------------------------------|---|
| | Committee/Council/Corporation) | collected and is channelized to either authorized collection centre or dismantler or recycler. ii. To ensure that e-Waste pertaining to orphan products is collected and channelized to either authorized collection centre or dismantler or recycler. |

2.4.1. Implementation of the rules- A review

Producers: Our survey showed that large brands who have manufacturing and assembling units are complying with rules with respect to management of e-Waste generated in their own units.

Producers however have only made weak attempts to set up collection systems for e-Waste generated by their customers. These attempts are also restricted to only their bulk customers through a take back arrangement.

Collection Centers: The infrastructure for collection centers is fairly well established in Bangalore. There are 148 dry waste collection centers for individuals to drop their e-Waste. The bottle neck is more with outreach and awareness since the public are yet to use the collection centers to drop their e-Waste

Bulk consumers: Compliance is restricted to a small percentage of large companies. Otherwise across the spectrum of large consumers including institutions, government departments and companies, compliance to the rules can only be described as extremely poor.

Authorized dismantlers and recyclers: There are 34 recyclers with a combined capacity to manage tones of e-Waste every day. The problem is these recyclers are not able to get adequate volumes to run their businesses.

Regulatory bodies: Compliance to the rules will only be taken seriously if the regulatory bodies use their power to enforce the rules. So far there has only been a weak attempt to ensure compliance. Regulatory bodies need to take to task producers, bulk generators or recyclers for serious lapses in compliances.

3. ABOUT THE STUDY

Government of Karnataka (GoK), has entrusted Environmental Management and Policy Research Institute (EMPRI), by way of its Order No.FEE/9/ECO 2009(ANNEXURE-VI), to conduct the study on “Market Survey of Re-usable e-Products”. After relevant literature reviews and looking at previous studies conducted it was decided to expand the study to include e-components as well. The study is now entitled “Market survey of re-usable e-products and recycled e-components”.

The study has been conducted in collaboration with SAAHAS, a reputed NGO having 14 years of expertise in waste management.

3.1. OBJECTIVE OF THE STUDY

- i. To examine and analyze the handling (disposal) of e-Waste by different stakeholders and to identify and analyze the flow cycle of these products both in formal and informal sector;
- ii. To examine and analyze the flow of re-usable e-products and recycled e-components from formal and informal sectors and other stakeholders into the market and market potential of these products;
- iii. To identify the gaps in implementation of the new e-Waste guidelines and to make recommendations that will support better compliance by all stakeholders.

3.2. METHODOLOGY ADOPTED

The methodology was developed so as to identify and analyse the flow of e-Waste from various sectors to the market and also to address the gaps during the retrieval of resources from e-Waste. In this relation, stakeholders were surveyed for a questionnaire-based interview. The information has been gathered through interviewing primary sources and secondary sources. The methodology evolved through the following steps.

3.3. REVIEW OF THE LITERATURE:

Advances in the field of science and technology brought about industrial revolution in the 18th Century which marked a new era in human civilization. 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 many problems including the problem of massive amount of hazardous waste and other wastes generated from electric products. These hazardous and other wastes pose a 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 developments.

According to UNEP (2005) and highlighted by Bjorn Appelqvist in his research paper, the production of electric and electronic devices is the fastest growing sector of the manufacturing industry in industrialised countries. Fast technological development and intense marketing lead to a rapid replacement process. UNEP (2005) has estimated that 20-50 million tons of electrical and electronic waste (ee-Waste) is generated to developing and transition countries. China is, by far, the largest receiver of exported ee-Waste and can be receiving more than 70% of ee-Waste produced globally (**Ketai et al, 2008**), but also other countries, such as India and Nigeria are receiving substantial amounts of e-Waste from abroad(**Ongondo et al, 2011**).

Booming information technology along with dominant services sector contribution in GDP (GoI 2009), changing consumption patterns and significant jump in the use of electronic gadgets are the major drivers for the increasing generation of e-Waste in India. Increase in per capita income in Indian cities result in high rates of obsolescence, which in turn drives more generation e-Waste. Though import of e-Waste is not allowed by the Indian Law (MoEF, 2008) trans-boundary movement of e-Waste cannot be controlled as in most cases the borders are not fully protective, which has been a true indicative by **Prof. Dr. Sudakar YEDLA, of Indira Gandhi Institute of Development Research.**

Later in the paper, it was mentioned that, some states which are in fore-front of “services” dominate e-Waste generation. According to the study by MoEF (2008) ten states namely Maharashtra, Tamilnadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab in that order generates 70% of the total e-Waste generated in India. Unlike in the case of municipal solid waste, e-Waste generation is largely dominant cities. Sixty-five cities in India are reported to be generating more than 60% of the total e-Waste generated in India. Metropolitan cities and other cities whose economy is driven by services sector are listed among the top e-



Waste generators in the country. While Mumbai tops the list Delhi, Bangalore, Chennai, Kolkata, Ahmadabad, Hyderabad, Pune, Surat and Nagpur follows in that order. Western region dominates the share of e-Waste generated in the country followed by Southern and Northern regions.

According to Alexis Vandendaelen of Umicore Precious Metal Refining; e-Waste should be seen as an opportunity rather than burden. The phrase “waste management” should be replaced with “resource management”. The ideal way of resource management would be to first make local pre-processing efficient, followed by maximum recovery of materials and proper treatment of residual waste in countries with the best technologies for the job, with proceeds shared fairly and equitably. e-Waste is a mine of precious metals but poor regulations simplify its squandering away. Computers, mobile phones and other electronic products use a staggering 320 tonnes of gold and more than 7500 tonnes of silver annually worldwide. As per the study conducted by Global e-Sustainability Initiative (GeSI), one tonne of scrap from discarded computers contains more gold that can be produced from 17 tonnes of gold ore. A mobile phone contains 5 to 10 times more gold than gold ore. About 17 precious and semi-precious metals can be extracted from e-Waste. Because of lack of sufficient recycling units in formal sector, the informal dealers (scrap dealers) extract as much as they can and export the rest.

According to a new market report by Transparency Market Research, material processing and its recovery has accounted for 36.4% of the e-Waste services revenue in 2012. The global revenue generated through recycling/reuse of e-Waste components such as metals, plastics, silica and others will reach USD 13,856.6 million in 2012. This will further reach USD 25,192.8 million in 2017 at a rate of 12.7% during the forecast period. Recycled metals are the largest revenue generating segments accounting for about 53.7% revenue of the e-Waste recycled components market in 2012.

In the view to above mentioned paragraphs, many research reports were studied and reviewed to gain insight into the subject and a baseline study was done. Base on the baseline study an “Inception Report” was prepared and submitted to DFEE, GoK.

3.3.1. Collaboration:

It was decided to do the study in collaboration with Saahas, an NGO who already had considerable experience in the field with all the different stakeholders including the informal sector.

3.3.2. Primary source of data/information:

The primary survey carried out was for stakeholders which has been identified as below and designed survey formats against the stakeholders (Annexure I to VII):

- i. IT companies
- ii. Showrooms that sells electronic items
- iii. Shops that repair/ refurbish/ re-sell electronic items
- iv. Authorized e-Waste recyclers
- v. Informal e-Waste recyclers
- vi. Banks
- vii. Households

3.3.3. Secondary source of data/information:

Secondary source of data/information was collected from Karnataka State Pollution Control Board (KSPCB), Secretariat (e-governance), GIZ, ASSOCHAM etc.

3.3.4. Field Survey:

The field survey has been done by visiting the above mentioned stakeholders and filling up the survey formats designed especially for different stakeholders.

Nearly 8 local dealers from different places such as Shivajinagar, Bismillahnagar, Majestic area etc. who usually collect e-Waste from homes and showroom were contacted. 10 repair and reseller shops who generally repair, refurbish used e-products were visited. Nearly 7 showrooms such as Croma, Pai International, Girias, E-Zone, Reliance Digital, IFB, Panasonic were visited and surveyed. Although 5 IT companies were contacted namely DELL, IBM, HP, HCL and WIPRO but only 3 companies gave appointments for the visit. Out of 34 registered e-Waste recyclers, 11 recycling units were visited and surveyed. However, collecting details on data from informal sector was very difficult. The data collected were interpreted based on assumptions.



Picture 1: Some of the photos taken during the survey to various stakeholders

3.4. STUDY AREA

Bangalore, situated in the Deccan Plateau in the south of India, has emerged not only as the Silicon Valley of India but also as one of the top IT destinations in the world. Due to its altitude, the year-round temperatures remain significantly lower than in the surrounding plains. With the liberalization of the economy in the early 1990s, the computer software industry started booming in Bangalore. The sudden spurt in the



number of IT firms has had its impact on various aspects, particularly in the form of increased demand for various supportive resources – human resources, infrastructure and transport in particular. The software growth has brought in both positive as well as negative impacts; the positive being in the form of a significant economic development with substantial progress made in terms of software exports, accounting for 40 per cent of the country's exports.

Other positive impacts include business expansions, employment generation, improvement in standard of living and purchasing power.

On the other hand, rapid economic growths has led to changing lifestyles such as increased use of automobiles, use and throw away culture, which exerts an immense pressure on resources (energy) and the environment, while increased demand for water and related services adds to the pressure.

However, coping with changing lifestyles has brought about many other social, psychological, environmental and ecological impacts on the city. Views concerning the changes, positive accompanied by negative impacts on physical and mental health, changing life styles, congestion, pollution leading to an increase in waste generation, e-Waste in particular, increase in demand for resources particularly land and water, have been aired by academicians, professionals, officials, politicians and the general public. Because of rapid growth of IT and software related companies in and around Bangalore city, it has been selected as the study area.

4. PRIMARY SURVEY ANALYSIS

The study was conducted with different stakeholders through surveys made during field visits.

Separate data collection formats has been designed for each stakeholder and the formats are included as **ANNEXURE - (VII to XI)**. The stakeholders identified for the survey is illustrated in the flow chart below:

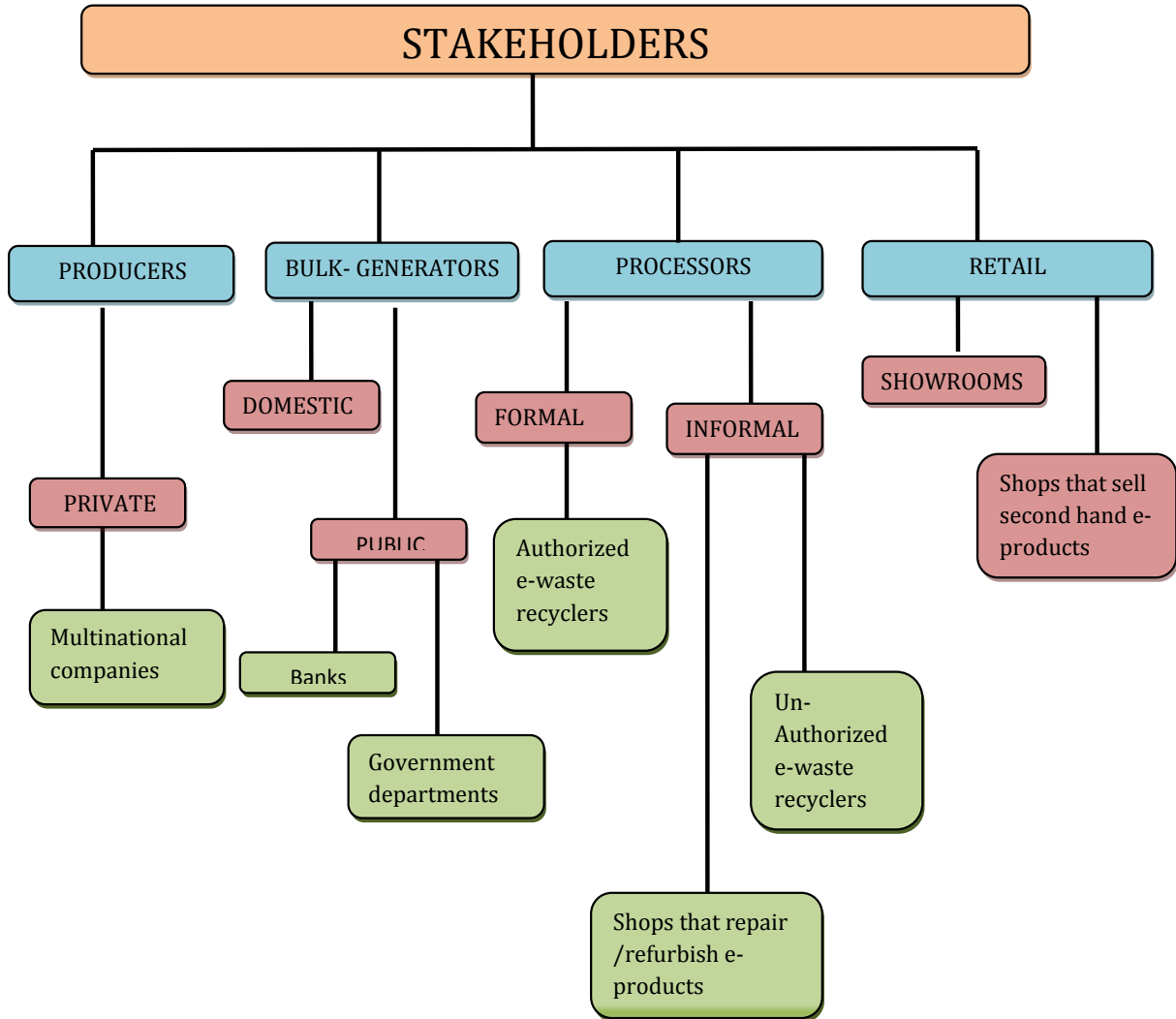


Figure 5 Flowchart of the stakeholders

In the flow chart we observe that bulk generators include the domestic and public sector and the producers include the private sector. The private sector includes the IT and other companies. In terms of public sector it includes government departments.

Consequently, processors comprise informal sector and formal sector. Informal sector includes unauthorized repair and refurbish shops, unauthorized dealers, unauthorized retail shops that deals with e-products along with the unauthorised e-Waste processors who are mainly involve in recovering resources from e-Waste. Similarly, the formal sector includes authorized e-Waste recyclers. The retail sector includes showrooms and shops. Through these surveys we have tracked the flows of e-Waste.

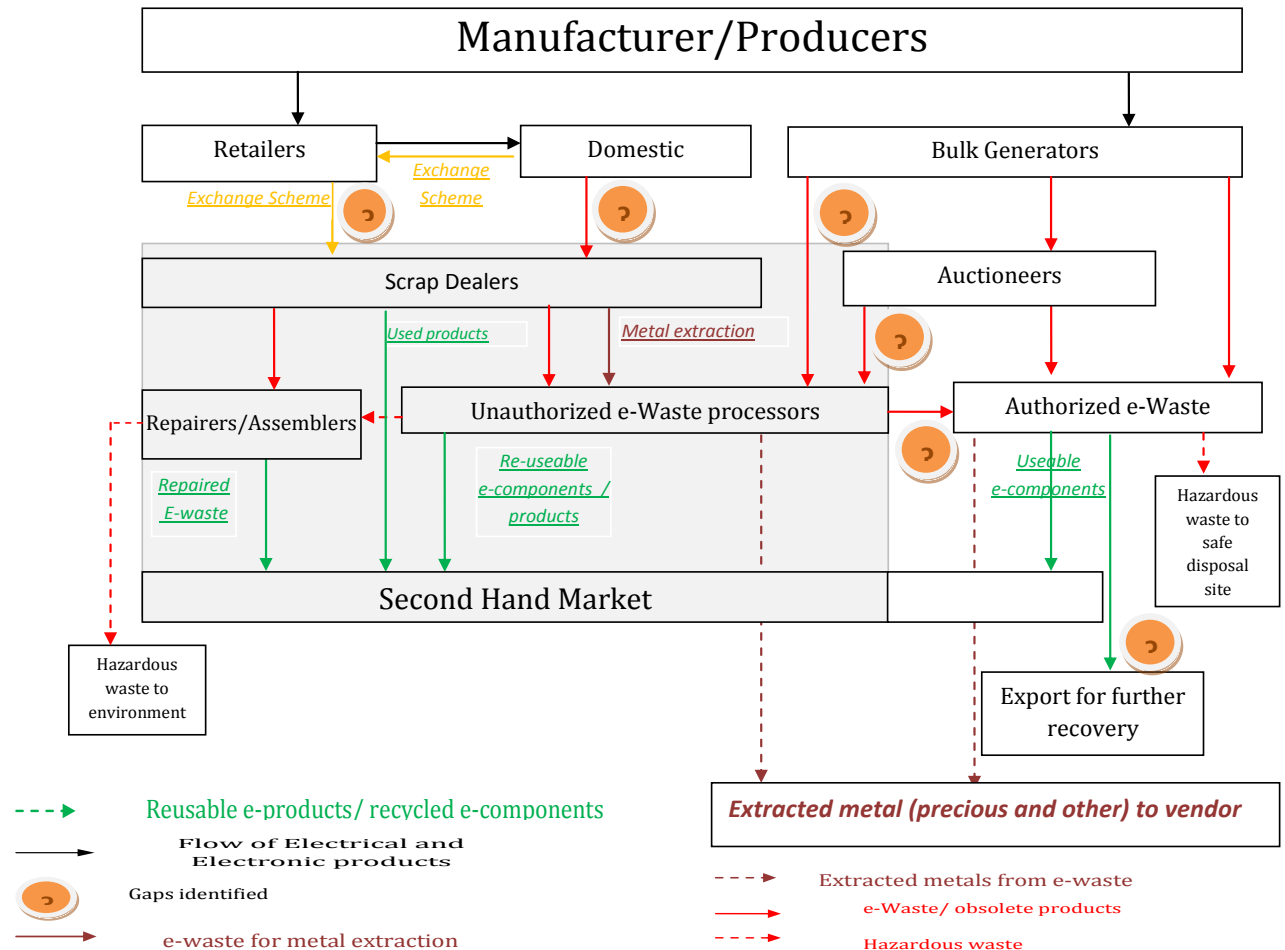


Figure 6: Flowchart of the flow of e-products from cradle to grave

The above Chart documents the various stages of e-Waste management with respect to the current situation. Reuse, recovery of reusable e-components, extraction of precious metals, recycling and export to foreign countries for extraction.

E-Waste generators, who dispose e-Waste with minimum or without any dismantling viz. Retailers, Domestic (households/commercial outlets), Bulk Generators (IT companies, Govt offices, and banks), represent the primary source of e-Waste. Blocks width size represents stakeholder’s share in e-Waste handling and management business and its contribution to e-Waste reprocessing.

There is a significant 'second hand market' which is prominently displayed but this market operates largely in an unauthorised framework which is depicted as a grey background. The Chart also captures the unchecked gaps as question marks i.e., flow of e-Waste from generators/auctioneers to the informal sector. These are the bottle necks which need to be plugged, so that waste flows to the formal sector. Further, we do not have sufficient capacities to extract precious metals efficiently from e-Waste, in this country. Some recyclers, therefore, have an export licence, who send these fractions abroad.

4.1. PRODUCERS AND BULK GENERATORS

Karnataka continues to lead the country so far as development of IT, BT and BPO companies are concerned. The state Government has been encouraging the setting up of IT, BT and BPO companies in major cities other than Bangalore as well.

In Bangalore, the IT industry is divided into three main clusters- Software Technology Parks of India (STPI), International Tech Park Bangalore (ITPB) and Electronic City.

There are around 24 Indian IT companies whose headquarters are based in Bangalore and around 845 STPIs in Bangalore having multinational computer software based companies.

Field survey analysis

Our study attempted to reach out to industry to determine the extent to which companies have complied with the new e-Waste rules.

It must be added here that it is extremely difficult to extract relevant information's from industries

We reached out to more than 20 companies but only representatives of two companies namely WIPRO and IBM spared some time and met us. HP responded to our questionnaire through e-mail.

It must also be noted that the information that we received through our field study was more relevant to the role that these companies play as a bulk generator than as a producer

FACTS RETRIEVED FROM THE WEBSITE

IBM Global Assets Recovery Service:

IBM's Global Asset Recovery Services (GARS), with many years' experience of managing the IT assets of IBM on a massive scale, fully understands these needs and can help to deal with disposal in a much more affordable, more manageable and more flexible way. GARS Asset Recovery Solutions enables the disposal of defective assets and those without market value in an environmentally safe way and in accordance with applicable local country laws. The comprehensive services cover IBM and non-IBM equipment, minimising both the costs and the burden of administration, enabling you to maximise the revenue of unwanted IT. Asset Recovery Solutions provides very affordable one-stop shop for disposal.

Source: <http://www03.ibm.com/financing/in/lifecycle/recovery/>

1. Case study on IBM:

The Company has generated 79.07 MT of e-Waste for the year 2012-13, while they have approvals to generate 100 MT of e-Waste per year.

Generally the e-Waste generated in the company, is packed in carton boxes and then sent to E-Parisaraa for recycling. It is also learnt that, IBM’s Global Assets Recovery Service reuses and refurbishes used equipments. The internal procurement of IT equipments such as PCs, laptops etc. was termed as confidential information by the company and was not shared.

With regard to the take back system for obsolete products, IBM has outsourced the responsibility to registered e-Waste recycler- E-Parisaraa. Individual customers can dispose their IBM obsolete products through an effective communication system, supported by Toll Free No. provided by E-Parisaraa.

2. Case study on Wipro India Ltd:

IMPORTANT FACTS

WIPRO as an ROHS implementer:

WIPRO was the first to introduce Restriction on Hazardous Substances (RoHS) Desktop PC in India in the year 2007. Currently, all the products of WIPRO are RoHS compliant. The goal was to make the range of personal computing products 100% (including speakers) RoHS compliant by 2010. The first milestone is to eliminate PVCs and BFRs from the products by 2009 and phthalates, antimony and beryllium by 2010. The following are some milestones in the evolution of Wipro's Green Computing:

| | |
|--|---|
| <p>1. Gradual move towards Low Power LCD based monitors from Traditional CRT monitors, which draws high energy LCD monitor, saves power to the extent of 40watts per unit compared to CRT Monitors.</p> | <p>2. Introduction of Small form factor products (Low power components), that use almost half the power of regular PCs.</p> |
| <p>3. Careful selection of certain low powered components such as energy efficient processors with rated Operational power, as low as 8 watts, while traditional power would range at 22 watts.</p> | <p>4 . Introduction of Innovative Products like N-Computing PC Solution & India's smallest (All-in-one) “PROTOS PC” launched - drastic step towards energy Preservation.</p> <p>5. Recyclable & degradable packing materials.</p> |

The Company shared quantitative information’s on generation of e-Waste within the company for the last five years.

It is found from data that 1553.682 MT of e-Waste was generated and recycled over a span of a year (2012-13) on an average. It was further learnt that, Wipro disposes its e-Waste of obsolete products through Attero, a Delhi based company.

Also the company through a communication system with their core customers take back its obsolete products. Some products are donated by company through isolation process the details of which are not revealed. However, one of the interviewee stated, organization like NASCOM are interested in taking up the used products from WIPRO, as donation

IMPORTANT FACTS

HP's opinion on policy for e-waste:

Given that EPR pins down one single entity, single authorization may make the implementation smoother. Closely linked to this is the reporting issue. Reporting to single authority for country wide operations may ensure development of central inventory and easier tracking and monitoring. For KSPCB that has jurisdiction over Head Offices of some of the key EEE Producers, the agency should collect information on country-wide activities and not specific to their State.

Secondly, e-waste, unlike hazardous waste or bio medical waste, are not site-specific where the generation capacity is known. The e-waste volume depends on the response of the consumers and hence difficult to predict. It is our assumption that as awareness about e-waste grows; the response will also get better over the years. Hence there should be no cap on the limit of e-waste that can be collected by a Producer in the Authorisation granted. The idea is to encourage more e-waste collections and not to cap it.

3. Case Study on HP:

The Country Manager, EHS Dept, HP, shared some very basic information through e-mail. However the company did not furnish direct answers to questionnaire, and stated that the information was confidential

However, it was decipher that the Company has a system for taking back the obsolete products. But, this take back system largely addressed the institutional consumers who purchased HP products in large volumes.

Further we did contact the service centres of company in Bangalore was contacted and following information were received. 15 service centres for HP products in Bangalore, where they only provide services to repair the products, if it is 1 to 3 yrs old, when spare parts are available.

However, the company does not have a policy to take back any obsolete HP products from individual customers. As of now, the company does not have enough collection centres, it would be necessary that service centres of MNCs be roped in for take back of individual products as it becomes obsolete.

This effort needs to be made through the service centres that, individual customers can also drop off their obsolete HP products and the company can accept the take back system. This would be reliable source for individual customers to hand over their e-Waste, to the authorised recyclers, without burdening the collection centres separately. Manufacturers or the private limited of MNCs need to make efforts at the earliest so as to channelize the e-Waste into the right hands.

The company expressed that the take back policy is still not streamlined due to lack of cohesive thinking between the various stakeholders. However specific examples are brought on record to demonstrate this. Also there are no recommendations to overcome the difficulties.

There is a feeling among representatives of the company that different stakeholders have different interpretation of rules. The legislation effective from May 2012 is an additional strength for safeguard of environment and helps other manufacturer support HP duly focusing to process of e-Waste. With formal e-recyclers being supported by the central and the state government, the bottlenecks in building a better reverse supply chain of E-Waste can be avoided.

Different interpretation of the rules poses a challenge in its smooth implementation. Similarly, authorization of multiple agencies for a single producer and lack of uniformity in the authorization process, are challenges in the existing Rules/ Guidelines.

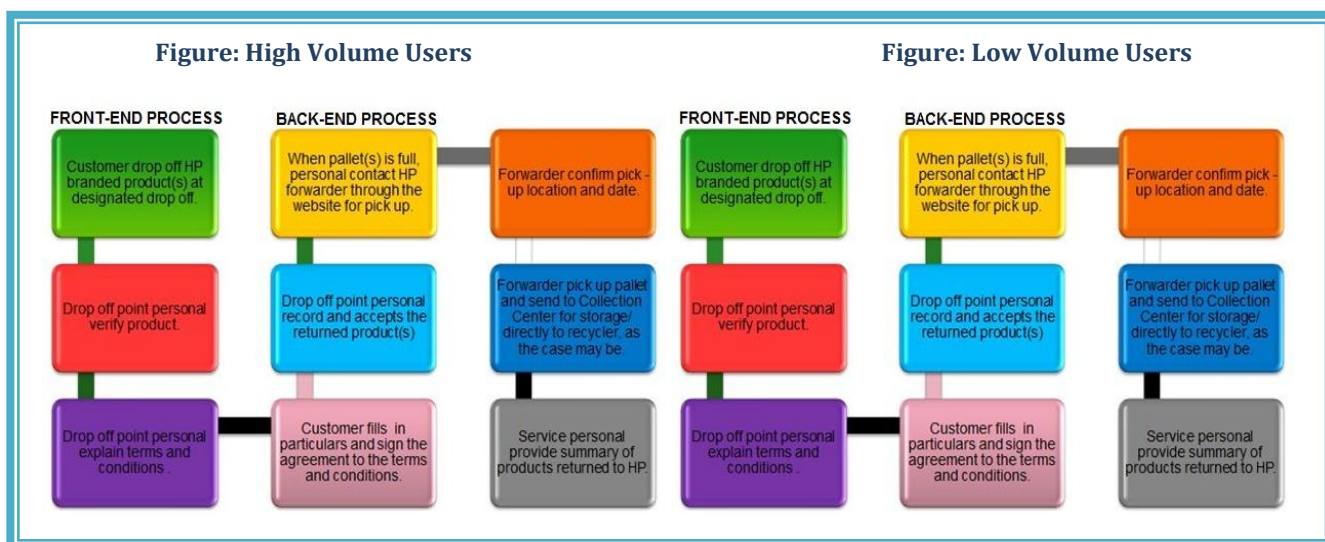


Figure 6: Take- Back system for high volume & low volume users

4.1.1. Issues and challenges:

i. Producers

Most producers are aware of the new rules and comply with it .They have a formal channel to manage the e-Waste generated within the organization. Beyond this, the compliance are neglected.

The fraternities of producers in line with EPR are yet to develop and demonstrate a serious attempt to implement the e-Waste rules,so that a meaningful reverse logistics system is established which will account for all their customers putting back obsolete WEEE back to reuse and recycling.

As producers are unwilling to specify the bottle necks, the exact reasons are unknown.

The cost of investment in a reverse logistics system appears to be prohibited.

All large producers are members of MAIT (Manufactures Association) which effectively presents the collective thinking of the industry to the government, on issues related to promotion and expansion of the industry. What are the issues related to bringing members together again to implement all aspects of the new e-Waste rules 2011?

ii. Bulk generators

Within the private sector, multinational and Indian companies make up the bulk users. Today there are systems in place, which makes it possible for e-Waste generated to be sent to authorized recycling as is required under new rules.

However, the study shows that bulk consumers continue to use informal and authorized channels for recycling and disposal. This preference for the informal sector is because it offers better prices for the e-Waste, as compared to the authorized recyclers.

In particular, the BPO (Business Processes Outsourcing) segment is seen to be frequent offenders.

The new rule does not require bulk consumers to obtain authorization from the PCB for generation of e-Waste. Instead they have to only ensure that e-Waste generated by them is channelized to authorized collection centers, registered dismantlers or recyclers. They have to, then, record this in Form-2 and make such records available for scrutiny by the State Pollution Control Board or Pollution Control Committee as and when required. This aberration will make it difficult if not impossible for an inventory to be maintained and to document the e-Waste generated by the sector as a whole.. The circular on applicability of e-Waste rules, 2011 to bulk consumers are attached as **ANNEXURE-XII**.

iii. Government Departments

Government departments are also bulk generators. As yet, there are no guidelines to monitor and regulate the flow of e-Waste in these Departments, e-Waste generated by these departments is supposed to be regulated by the department of e-Governance. As such, all government departments are awaiting guidelines from this department as to how to account for the waste in their books?

In the absence of these guidelines, departments either pile up the waste or dispose the same along with other scrap, including furniture and metal waste. Even in the case of the government, maximum revenue from waste is the criteria for the selection of a disposal system. Thus, an auction system is used for disposal to the highest bidder. Those participating in the auction are not necessarily authorized e-Waste recyclers.

Government departments also have arrangements with a vendor to take back their obsolete equipment in exchange for new equipment purchased. This vendor, in turn, is not made accountable for the e-Waste, which he receives and consequently sold to the informal sector.

However, when e-governance department was visited, it was observed that, a circular was issued to all government departments in August 2011, regarding the disposal of computers and its accessories. The circular mentioned some guidelines which have been illustrated below:

- a) In view of the rapid change in the technology in the field of computers, by keeping 20% depreciation a minimum period of 5 years is to be considered as the period of longevity for computer and accessories.
- b) After a period of 5 years from the date of procurement of the computers, UPS and other accessories, the un-repairable and unserviceable computers and other accessories, can be declared as obsolete/ useless.
- c) As per the procedure fixed vide Govt. Orders DPAR39EGV2204 Dt. 07.01.2005 and DPAR 147 EGA 2009 dated 15.02.2010, respective departments whenever they desire to take the approval for their E-Governance Annual ACTION Plan, they should provide the details of the computers and other accessories to be disposed off and should take the approval of E-Governance Annual Action Plan Approval Committee and the Technical Advisory Committee formed under the chairmanship of Principal Secretaries/ Secretaries of the respective Departments.
- d) The Buy –back or the disposal of computers and its accessories which are declared as obsolete should be done through public auction as per the guidelines of Government of India.
 1. The Departments of Government of Karnataka hereby instructed to follow the guidelines as per Para (2) above, for fixing of the period for longevity to dispose of the computers and accessories.
 2. The Principal Secretaries and Secretaries are hereby requested to bring this circular to the notice of their respective departments.
 3. This circular issued in concurrence with the note No. AE 548 – Exp. 12/2013 of Finance Dept. Dt. 20.07.2013.

The circular has been attached as **ANNEXURE-XIII**

Way forward: The KSPCB have directed e- Governance Department to follow strict instruction in disposal of e-Waste only to the registered 34 e-Waste recyclers and also through auction portal of MSTC. (Letter to e-Governance has been attached as **(ANNEXURE-XIV)**). However, a circular should be directed through DEE to all the government departments with proper guidelines for disposal of their e-Waste from their departments, as circular with CASENO.46EGE 2013(which is attached as **annexure no.XIII**) do not portray definable criteria's and guidelines for disposal of e-waste.

Disposal at this point should be through authorized recyclers. The department will have a choice of using an auction or take back system.

4.2. PUBLIC SECTOR BANK

4.2.1. Case study of a public sector bank (name withheld)

The bank had recently introduced a policy, where equipment which is more than 5 years old, is considered as obsolete and becomes eligible as e-Waste.

On the other hand the bank enters into a buy back arrangement with various vendors.

Thus all IT related e-Waste is exchanged for new desktops and other IT equipment. The vendor that facilitated this exchange programme is CMS Info

Likewise through an arrangement with BSNL, obsolete telephones and other communication equipment, is exchanged for new equipment.

A similar arrangement was made for printer cartridges.

The arrangement with the vendors did not take into account the new e-Waste rules. Discussions with the vendors confirmed that this waste was most likely sold to unauthorized recyclers.

4.2.2. Issues and challenges:

In schedule 1 of the new e-Waste rules, the list of items goes far beyond just computers and telephones.

The public sector bank in our case study included only a few products as e-Waste. The rest of the e-Waste was disposed as regular scrap.

Also the policy for e-Waste was mostly applicable to equipment generated at the Head office. This policy does not apply to the branch offices, who have not been given any direction on management of e-Waste

Systems and Printers which are disposed, through 'take back', is required to ensure how this waste is further handled.

4.3. DOMESTIC SECTOR:

Introduction:

Households and small shops and enterprises generate e-Waste in small quantities. This waste is collected along with other municipal solid waste from households and commercial outlets through a door to door collection.

The current practice of door-to-door collection of municipal solid waste, does not support segregated collection of E-Waste. TO some extent, the BBMP has initiated waste segregation at source . This waste is collected as wet and dry fractions. E-Waste however is integrated in the dry fraction and has to be recovered during a secondary

sorting exercise. In case the waste is not segregated at source, then the mixed waste also contains e-Waste which may get recovered by the waste collector or go to the landfill. This situation however holds true for e-Waste, which has little or no economic value. Products like computers and peripherals generated at the household level are most likely to be kept aside and sold to a scrap dealer, which ultimately goes to unauthorized recyclers. Sometimes the waste collector is also known to retrieve components, which have some economic value for instance metal and plastic components, are retrieved.



Picture 2 Retrieving components from CFL bulb by a pourakarmika from MSW

The BBMP has recently taken further measures to motivate households to support the new e-Waste rules In a letter No. PCB/1902/WMC/2013-14 dated 28-11-2013, all its zonal offices were directed to follow guidelines storage and disposal of E-Waste:

- a. The waste collectors to deposit the e-Waste in dry waste collection centres &
- b. Disposal of e-Waste to KPSCB registered re-users.

Products which are generally retrieved by waste collectors during a door to door collection include

- a. TV remote;
- b. Mixer Grinder;
- c. Compact disks;
- d. Pen-drives;
- e. CFL blubs, tube lights and Tungsten blubs;
- f. Batteries
- g. Cables/ Wires;
- h. Mouse and other computer accessories;
- i. Chargers/ Adapters;
- j. Printed Circuit board;
- k. Spike busters/ switches and also television, radio and other audio gadgets are also disposed rarely. Electrical toys are often neglected among other e-Wastes.

Electrical gadgets/appliances in general, are a mix of different components like different grades of plastic, metals, rubber, etc., than a single component. These building blocks of electrical gadgets are separated before handing it over to traditional waste buyers or to avail better monetary benefit. This practice tends to change the e-Waste facet at the collection stage, resulting in dumping of non-resalable hazardous waste.

Most of the e-Waste gathered would be a component of an electrical gadget than the complete gadget itself. Collected e-Waste is dismantled for metals like copper wire / aluminium holder and plastic among other materials by *pourkarmikas* before handing it over to local waste buyers.

According to the BBMP 145 of the planned 198 dry waste collection centers have been already operational in Bangalore. However, these centers are yet to start effectively functioning as collection centers for e-Waste.



Picture 3 e-waste collected from households (door to door collection)

One of the collection centers is run by Saahas. The collection centre KASA RASA, they collect e-Waste from residential associations, schools, individuals etc. During the year 2011-12 they have collected 2.4 tons of e-Waste from households which included IT equipments and peripherals which they have later sent it to authorized e-Waste recyclers namely M/s. Eco-Bird Recycling Company Pvt. Ltd.(1 ton), E-Parisaraa Pvt.Ltd:e-Waste(0.512 ton), and E-waradd recycling company (0.480 ton). During 2012-13, they have collected 3.2 tons of e-Waste from household which also included IT equipments and its peripherals, later which they have sent it to Ecobird Recycling Company Pvt. Ltd. and Trackon Recycling Company Pvt. Ltd.

On the other hand these centers find it difficult to work with only the low grade waste in the form of wires and CFLS or tube lights which are dropped at the center. The authorized recycler now expects a payment for this grade of material to be picked up. So disposal of these items becomes a cost center for the dry waste collection center.

Says Mansoor, Employee of Dry Waste Collection Centre, Jayanagara “the expectations in terms of purchase price for electronic waste with better scrap value is such that we cannot afford to buy these items”. Though any individual approaches them to drop e-Waste at his place, he cannot afford to buy. This waste therefore also flows to the informal sector



Picture 4 Dry waste collection centre

Issues and Challenges:

- a. Collection of mixed domestic waste;
- b. Scavenging for re-sealable waste from mixed waste during collection;
- c. Crude methods of e-Waste dismantling during collection;
- d. Extraction of electrical components/metals/plastics and others during collection.
- e. Scientific disposal of CFL blubs and other low grade waste adds to the accounts overhead of DWCC;
- f. Financial constrains of DWCC to buy e-Waste from domestic consumers

Recommndations:

- a. Creating awareness among community members about scientific disposal of e-Waste;
- b. Educate *Pourkarmikas* about the hazards of e-Waste and scientific collection of e-Waste;
- c. Strict enforcement for using Personal Protective Equipment;
- d. Strict enforcement for handing over e-Waste at it is without dismantling during collection;
- e. Strengthening of Dry Waste Collection Centre to buy more e-Waste;
- f. Polluter pay principle for CFL and tube-light manufactures;
- g. Popularising DWCC/ other KSPCB authorised waste buyers as “used electrical appliances/gadgets or e-Waste” buyers among manufacturers and sellers.

4.4. FORMAL SECTOR:

Introduction:

This study focused on authorized e-Waste recyclers whom we have defined as the formal sector. Authorized e-Waste recyclers are those who have authorization from Karnataka State Pollution Control Board (KSPCB) to process e-Waste in an environmentally sound and scientific manner. According to KSPCB there are 34 registered e-Waste dismantlers and recyclers. The complete list of the same is included in **ANNEXURE-XV**. Out of 34, 11 e-Waste dismantling and recycling units were visited and information was collected through the questionnaire format. The questionnaire that was used to gather the information is included in **ANNEXURE- X**.

4.4.1. Case study on Arrow Systems:

Arrow Systems located in Peenya Industrial Estate, was established in the year 2011. This unit has authorisation for dismantling and refurbishing of Computers, storage devices, laptops, workstations and monitors of capacity 120 MT/A. Arrow Systems mainly obtain their e-Waste commercially from S.P. Road (Avin Computers, DN Multimedia, RA Technology, India IT shop), and local markets. Every month around 500 kgs to 1 ton of e-Waste is collected.

The raw materials that are collected by Arrow systems are segregated into two main waste domains. Those materials which can be further used are refurbished and sold to schools and colleges and those which are obsolete are dismantled manually and sent to E-Parisaraa for further processing. At present Arrow Systems only have the provision to dismantle the e-Waste manually besides having the set up of a dust collector. However they are making provisions to set up mechanized dismantling machinery.

From informal to formal

Initially, Arrow systems were unauthorized recyclers. They are now authorized dismantlers. This has helped them increase their business. However material flow continues to be a problem. This is something they hope to overcome through better engagement with companies.



Picture 5 Arrow systems recycling facility

4.4.2. Case study on K.G Nandini:

K.G Nandini located in Bidadi Hobli was established in the year 2009. This unit has authorization for e-Waste procuring and processing of capacity 7200MT/A to recover Aluminium (90 MT/A), Copper (120 MT/A), Lead (38 MT/A), Copper from wires Schedule IV of Sl.No. 7 of HW (40 MT/A) and recycling of plastic scrap(490 MT/A).

The company gets its e-Waste from the IT sector as well as other private companies. They also get material from the government. They mainly collect computers, refrigerators washing machines, CPU's, mother boards etc. The processes involved in the recovery of resources from e-Waste are manual dismantling, mechanical stripping of wires to gather plastics and copper separately and shredding of PCB's through high density separators to collect heavy and light metals separately. The recovered resources from the above mentioned processes are sold to the authorized downstream vendors. Any hazardous wastes obtained are sent to TSDF.

4.4.3. Case study on ECO BIRDD

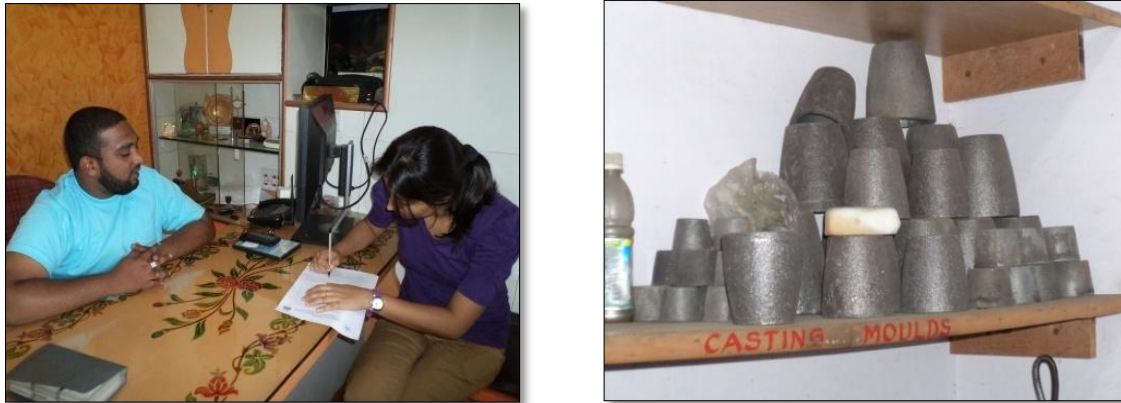
Recycling Company Pvt. Ltd: The Company is located in Nayandahalli and was established in 2011. This unit has authorization for e-Waste procuring and processing of capacity 350MT/A. They obtain e-Waste mainly from the IT sector, commercial enterprises, private companies and government. They collect telephones, computer systems, cell phones, laptops etc.

The CRT's that they collect are sold to Tech logic in Chennai. The rest is managed in Bangalore.

SMEs like ECO BIRDD also have a good network within the informal sector. This network is also used to purchase waste from them at a rate of Rs 18-30 per kg

ECO BIRDD has processed 43 MT of e-Waste for the year 2012-13 out of which gold(0.5 kg) and silver(10 kg) was recovered. These precious metals are then sold.

Any hazardous waste obtained is sent to the TSDF. In 2012-13, 436 kgs of hazardous waste was generated.



Picture 6 Eco bird recycling facility

ECO BIRDD was once an informal recycler which has recently been formalised. They do not have a very large facility like the big established players in the market. They continue to struggle with material flows.



Picture 7 Hazardous waste storage room and precious metal recovery room

4.4.4. Case study on Eco e-waste recyclers India Pvt. Ltd:

ECO E-WASTE RECYCLERS located at Mutchari Industrial estate, Mysore road was established in the year 2012. This unit has authorization for collection, purchase and dismantling of e-Waste @ capacity 300MT/A.

They collect e-Waste from the IT sector, public sector and government. It was also learnt that they collect e-Waste through auctions. They mainly collect monitors, CPU's, UPS's, LCD's, servers etc.

They collect on an average 3 tons of e-Waste per month. They have the provision to dismantle the e-Waste manually and have set up a cyclone bag filter. All e-Waste recovered is sent to downstream vendors. CRT monitors are collected and sold @ Rs 600-700 per monitor. During the visit, it was observed that they might also be involved in the recovery of precious metals.



Picture 8: Eco e-waste recycling facility

ECO E-WASTE was once an informal recycler which has been formalised recently. They are not satisfied with the quantity of e-waste that they are dealing with.

4.4.5 Case study on Track on e-Waste recyclers Pvt.Ltd:

Trackon e-Waste recycler located at Vijaynagar was established in the year 2011. This unit has a capacity of 300 MT/A to reprocess e-Waste. The mainly collect e-Waste through MSTC and all kinds of e-Waste are procured by them. Trackon was once an informal recycler which has been formalised recently.

Like the other recyclers material flows continue to be a big challenge. Given their financial position they are considering closing operations.

4.4.6 Case study on E-Parisaraa:

E-Parisaraa located on KIADB Industrial area Dobaspet, was established in the year 2005. They are authorised to procure and process e-Waste of capacity 1800 MT/A. They mainly collect waste from IT sector, private, public, Government and commercial sectors. They collect all kinds of e-Waste. This unit has a separate collection area for e-Waste from where it goes to dismantling area. For the separation and segregation of e-Waste, workers manually handle the e-Waste and mechanical equipments are also used for the same.

E-Parisara follows sound practices to recycle e-Waste. It has a separate unit for dismantling CRT monitors. They also have a facility to dispose CFL bulbs and tubes in a scientific manner. The hazardous waste obtained after the processing of e-Waste is sent to TSDF. E-Parisara has given a high priority to the safety of its workers by giving them skilled training besides providing them with safety clothing and equipments. E-Parisara sends their PCBs after shredding to another unit at Peenya Industrial Estate to recover precious metals such as gold, silver and copper mainly.

E-Parisara continues to pioneer in e-waste management solutions in Bangalore. However they also expressed challenges to reach to achieve targets because of problems in the flow of e-Waste.

However, they have made good progress and have shown that dealing with e-waste can also be a good, sustainable business model.

4.4.7. Trishyiraya:

Located within the Peenya Industrial area, the organisation was established in 2010.

It is a sister concern of SIMS Recycling Solutions which is headquartered at Chennai. The unit of Trishyiraya at Bangalore has an authorisation only to procure, dismantle and store e-Waste upto 500 MT/A. The procured e-Waste is later transported to Chennai for further processing.

Ground Reality:

Many gaps in the working of Trishyiraya were observed. They are authorised as a recycling unit. However their operations are such that they are only acting as supplier of raw materials to their parent concern in Chennai.

They mainly collect their e-Waste from the IT sector. They deal with all kinds of e-Waste. The method followed to separate and segregate the e-Waste is mainly by manual dismantling. They also have a dust collector unit set up. It is interesting to note that Trishyiraya sends hazardous waste obtained after dismantling to Chennai.

During the survey they stated that they do not collect CRTs and CFL bulbs and tube-lights, however at their site it was observed that tube-lights were burnt in open spaces behind the collection unit.



Picture 9 Crushed and Burned tube lights in the Courtyard of Trishyiraya unit in Peenya

4.4.8 Samarthanam Trust for disabled:

Samarthanam located at Peenya Industrial Estate was established in the year 2010. They are authorised to recycle printer cartridges with a capacity of 337.5 MT/A. They mainly obtain cartridges from commercial establishments, IT sector and others. They only deal with empty printer cartridges. They dismantle the cartridges manually and the various components of the cartridges obtained are segregated and stored separately. Once sufficient quantity of the cartridge components are obtained, they channelize the same to the respective recyclers. The cartridges that are in working condition are refilled and sold to one of their clients.



4.4.9 Issues and Challenges:

Karnataka has the highest number of authorized e-Waste recyclers in the country (32). However the system continues to demonstrate gaps which need urgent attention

Some of these problems have been listed below

- Deficiencies in supplies of E-Waste : Most of the formal e-Waste recyclers in the city complain that they do not get sufficient material and hence operate their units at lower capacity. This puts a lot of stress on their business model and many of them are running under losses.
- Lack of enforcement of rules: The shortage of the supply of the raw materials is mainly due to its channelization to the informal sector. This happens through auctions, through buy back/take back systems, through exchange programmes and several other mechanisms.

- Poor monitoring of authorized recyclers. Even authorized recyclers are seen to be violating several regulations. As authorized recyclers they have access to several auctions which are reserved for only authorized recyclers. This material very often is again channeled back to the informal sector.

Recyclers are especially seen to use this channel when they purchase the waste from other cities or states. The material purchased from outside Bangalore is sold to the informal recyclers in small towns, who also offer a good price for the material. This also reduces the cost of transportation back to Bangalore.

- Recovery of precious metal: Currently the informal sector and even some SMEs use out dated and inefficient processes for recovery of precious metals. In fact the recovery of precious metals has tremendous potential to boost revenues of recyclers especially the SMEs. Currently the options open to them include, recovery of the precious metal through inefficient means or sale to the large recycler. Currently there are lots of issues around prices offered by large recyclers for this waste fraction. There is a trust deficit between small and larger recyclers. This situation needs to be sorted out through a stakeholder meeting with the different partner.

4.5. INFORMAL SECTOR

The flow of e-Waste in the informal sector is described in the chart below:



The survey was conducted through a set of questionnaires for the different category of people whom we have mentioned as stakeholders. **ANEXURE-IX** is a questionnaire designed for people who are engaged in repair, refurbishment and assembling of used e-products. **ANNEXURE-XI** is the questionnaire designed for the workers who are engaged in recovery of precious metals from e-Waste. Information was collected from the people engaged in repair and refurbishing e-products and then re-selling it in the market.

To understand the flow of second hand goods in the market, a field survey was conducted at some of the retailer shops (engaged in selling second hand e-products), repair/refurbishing shops, and some of the service centre's (engaged in repairing of used e-products).

In Bangalore, there are a large number of small enterprises who are engaged in repair and refurbishment. These enterprises are spread across the city. Most of them are not registered, under the shops and establishments Act, nor do they have a tin number. Given the activities that they are involved in, whereby retrieval of components along with repair and refurbishment also takes place, these units are also part of the informal network of recyclers

4.5.1. Case study on Supercool (purchase/ sales/ service):

Located in Kamanahalli main road, the shop repairs and refurbishes washing machines and refrigerators. They collect washing machines and refrigerators from households or showrooms on a monthly basis. On an average they collect 11 refrigerators and 6 washing machines per month. It was learnt that, they refurbish and repair almost every single piece that they collect and only around 1% that remains as waste goes to the scrap dealers. The turnover at Supercool for the sale of washing machines and refrigerators is around Rs. 3 lakhs per month.

4.5.2. Case study on super cooling systems:

Located at Banaswadi main road, this shop is owned by Mr. Norulla who repairs and refurbishes refrigerators, washing machines, microwaves and mixies. He collects the products mainly from households or shops. As far as the shops are concerned, they mainly purchase deep freezers, repair it and sell it. On an average in a month, they roughly purchase 12 refrigerators, 2 washing machines, 2 microwaves, 22 hand mixies and on rare occasions air conditioners.

Around 50-60% products get repaired and refurbished in their unit. The wastes that are generated during the repair of the products are sold to scrap dealers. An average of 30% waste is generated in their unit. The turnover at super cooling for sale of the products is hardly in Lakhs per month.

Ground realities:

Different products have different rates depending on the number of years and condition of the equipment. Refrigerators ranges from Rs 1000 to 7000 and washing machines range from Rs 3000 to 12000.

On an average a refrigerator sold at Rs.1000 will be purchased from the showrooms/household at Rs.500-700)

According to the said sources, in terms of waste and hazardous components that the product contains, they can be ranked as follows:

AC > Refrigerators > Washing machines > Computers

4.5.3. Case study on Alif Associates:

Located in Banaswadi main road, the shop repairs and refurbishes washing machines, refrigerators microwaves, mixies, TVs, LCDs, LEDs. The contact person Mr. Ameen was willing to cooperate with our questionnaire.

They collect the products mainly from showrooms. On an average they collect 20 washing machines, 60 refrigerators 50 TVs (including LED, LCDs), 20 microwaves, 15 mixies and seasonally ACs per month



Picture 10 people engaged in repairing of used e-products (L) and recovering metals (R)

They repair the products and give it to other dealers who sell second hand products. For LCDs and LEDs they mainly repair the screens. Nearly 70% out of total products that are purchased are repaired or refurbished and sold. This generates around 3-4 tonnes of waste which they give it to scrap dealers at Rs. 22/kg. The turnover for the sale of the products for Alif Associates is around a crore per annum.

4.5.4. Informal sector operations through hubs in Bangalore

A survey was conducted at various places like Shivajinagar, Gowripalya, Jolly Moholla, City market area, Bismillah Nagar to understand the ground realities behind the informal operations of e-Waste. It was learnt from the survey that, people work in clusters in this business. During the survey, we came across one such cluster in Shivajinagar, where a person collects all kinds of scrap (like furniture's, clothes, e-Waste etc.) the same is then stored in a shed from where other members in the cluster have access to a particular category that he is specializes in. As far as e-Waste is concerned, this system feeds waste to the informal sector.

In the course of our survey, we met several persons engaged in purchase and recycling of e-Waste under hazardous conditions. Most of these persons showed apprehensions about upgrading to the formal sector, since they had limitations in acquiring the necessary finance.

4.5.5. Issues and Challenges:

The Informal sector plays a major role in the processing of e-Waste. Even today 95% of e-Waste generated across the country is managed by the informal sector.

Given the repercussions on health and environment, it is clear that this sector cannot be permitted to work with e-Waste. At the same time, the skills within this sector need to be harnessed and put to use. The e-Waste rules have enough scope to support an Upgradation of the informal sector so that they are accommodated within a formal framework.

What are the challenges that are preventing this transition?

- **The problem is too widespread:** With no regulation whatsoever for so many years – informal activities are now too widespread. They are entrenched in every neighborhood and community. These activities now support a large livelihood base
- **Sector is uneducated with low economic background:** It is learnt during the course of the study that, the majority of the people who are involved in recovery of resources from e-Waste have no other source of income. They have been doing this business since several years and do not have any intention of adopting or scaling up to a better business model. Changing a mindset in such circumstances is difficult
- **Indirect support for the sector from all other stakeholders:** Across stakeholders, including large and small companies, government and the domestic sector and even recyclers- the informal sector is sought after for purchase and sale of e-Waste. Under these circumstances, it is difficult to elicit the change that is required
- **No enforcement of the rules:** The regulatory bodies have completely failed to check unauthorized recycling. There are no penalties levied to any informal sector activities



Picture 11 Informal operations

4.6. RETAIL SECTOR

The retail sector includes both small and large shops as well as large showrooms, which are either single or multi branded retail stores.

The study looked at the entire spectrum of retail stores. Among the large retail store questionnaires were sent to Girias, Adishwar, Croma, Pai International, IFB, Reliance Digital and Panasonic. Information was gathered from most of the outlets according to the questionnaire formats.

It is learnt that, these electronic showrooms conduct exchange programs, where old and used products, most of which are obsolete, were exchanged with new products. Once the showrooms receive the used products these are sent to their warehouses, where these are stored and then disposed of, to the highest bidder, resulting in a much unregulated system of flow of e-Waste into the informal sector. The main reason being the retail sector does not want to claim responsibility for the obsolete products once these are sold.



Besides the above mentioned facts, when asked about the quantitative data related to their exchange programs, no information was disclosed by the personnel of the respective outlets.

On the other hand, small retail stores are engaged with sale of second hand goods brought from the repair and refurbished trade, which again connects to the informal network.

4.6.1. Case study on retailer shops (who sells second hand e-products)

i. Mohit Computers:

Established in 2005, Mohit Computers is located on S.P Road, Bangalore. It was learnt that their establishment deals with the sale of second hand e-products such as computers, monitors, laptops, UPS, Speakers and hard-drives. They mainly get their products from dealers and distributors, who in turn, get them from IT companies.

The sales numbers for Mohit Computers on a monthly basis is mentioned in the table below:

Table 7 Sales Number of Mothi Computers

| E-products | Sale Numbers | Sale figures |
|-------------|--------------|---------------------------|
| Computers | Around 30/M | Approx. Rs 5 lakhs/ Month |
| Monitors | Around 50/M | |
| Laptops | Around 20/M | |
| UPS | Around 20/M | |
| Speakers | Around 30/M | |
| Hard-drives | Around 50/M | |

Once the second hand product is obtained in bulk it is usually sold to other dealers on a wholesale rate. The shop also undertakes repair of some of the computer parts such as mother-boards, SMPS, hard-drives and UPS.

It was learnt that, once they replace UPS battery, the waste battery is directly sold to scrap dealers for a nominal price. Nearly 15-16 used batteries go out as waste from Mohit computers each month.

ii. Case study on D.N. multimedia:

Established in 2005, D.N. multimedia is located on S.P. road, Bangalore. While interviewing Mr. Gopal it was learnt that they deal with second hand sale of servers. They mainly obtain the servers through distributors and dealers. They also collect servers from large IT companies including well known brands.

According to the law, import of e-waste is banned. But it can be seen that on the ground retailers like D.N Multimedia are able to import e-Waste.
 The average cost of a server is Rs 1 lakh. Purchasing waste servers and refurbishing them is a good business, while purchasing servers, which are considered as waste are assigned value according to their condition. If a server is totally in an un-repairable condition but still through some replacement it could be made to work, it cost around 20 thousand for the dealer and if a server have some manufacturing defect that need some refurbishment, it costs around 70 thousand for the dealers.

Their mode of operation is to collect the servers, repair their parts and sell it to other companies through dealers. Mr. Gopal also revealed that they also import servers.

They collect around 2400 servers annually out of which 50% can be repaired and refurbished and the other half is sold to the scrap dealers. The turnover for D.N. multimedia, while selling these second hand servers, ranges approximately to a crore/month as a single server costs around a lakh.

Besides the sale of the servers, D.N. multimedia also deals with other kinds of e-Waste such as computer monitors.

iii. Case study on Sri Sai Electronics:

Established in 2008, Sri Sai Electronics is located on S.P Road Bangalore. While interviewing Mr. Vinod it was learnt that, they sell second hand phones apart from assembling TVs from CRTs. He described the flow of the second hand electronic goods as follows





Picture 11: Surveying some of the retail second hand shops

4.6.2. Case study on Girias:

Established in 1971, Girias Investment Pvt Ltd, has their outlets in some of the most prominent cities of south India. For the study the outlet at Jayanagar Bangalore, was chosen. Consumer electronic goods such as laptops, Smart Televisions, mobile phones, refrigerators, washing machines, mixer grinders, micro wave ovens and air conditioners (seasonal) etc., are sold by them. They have a monthly turnover of 2-2.5 crore. An estimate of their monthly sales for various electronics is given in the table below:

Table 8 An estimate of Girias monthly sales for various electronics

| Electronics | Sales number(average) | Sales figure |
|-------------------|-----------------------|-------------------------|
| Laptops | 28/M | Rs. 2-2.5 crores/ month |
| Smart Televisions | 160/M | |
| Mobile phones | 105/M | |
| Refrigerators | 190/M | |
| Washing machines | 180/M | |
| Mixer Grinders | 220/M | |
| Micro wave ovens | 70/M | |

4.6.2.1 Exchange programme at Girias:

Their exchange programme is called “buy new and exchange old products”. Under this programme they take back old and obsolete products from customers and give the customers an option to go in for a new electronic product for which there is a price reduction depending on the condition of the exchanged product.

4.6.3. Issues and Challenges:

The products from the showrooms are sent to the dealers. The dealers having either the retailer shops or the repair shops, who in turn repair and refurbish the products and send them to the dealers, who resell the products in the market. The flow of the electronic products in most of the retail outlets (Adishwar, Pai Internationals, IFB, Panasonic, and Reliance digital) through exchange programmes is illustrated in the flow chart below:

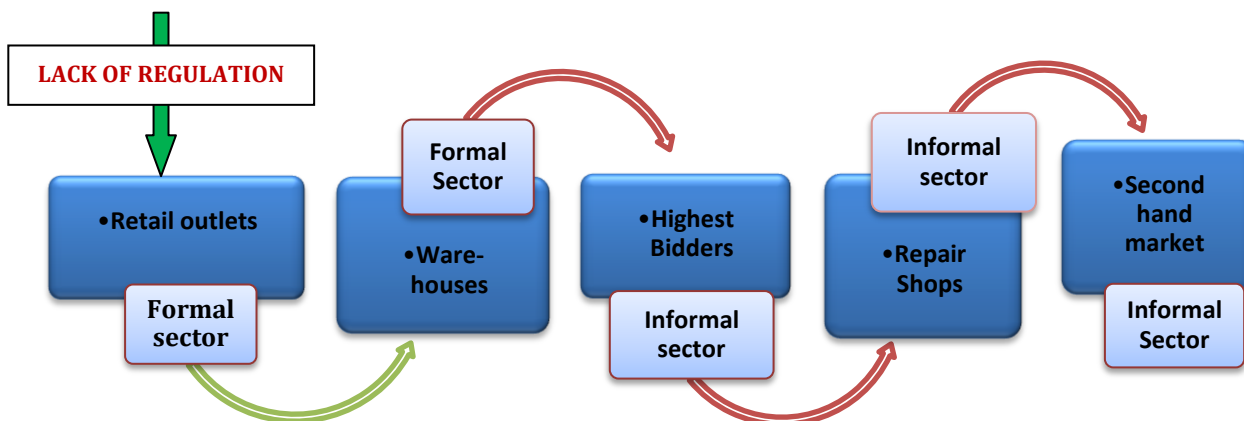


Figure 7 Flow of the exchanged e-products in the market

It is apparent from the back that there is a complete lack of regulation within the retail sector. As can be seen from the diagram above, this programme is a source of material for the unauthorized recyclers

4.7. ONLINE AUCTION PORTALS

E-Waste auctions are also very common and especially used by bulk waste generators as part of their e-Waste management systems.

The two most important players in this sector include Metal Scrap Trade Corporation Limited (MSTC) and Matex Net Pvt. Ltd.

These online auction portals have their own procedure to auction e-Waste from big companies, institutions or firms. The sellers and buyers have to get registered through online registration system in order to sell and buy e-Waste. It was learnt that, the buyers

for e-Waste has to provide all their authentic documents of authorization from KSPCB in order to procure e-Waste through MSTC.

Earlier before the introduction of the rules, the e-Waste was auctioned to scrap dealers and this was an entry point for waste to enter the informal sector.

This system has now been changed to ensure that only authorized e-Waste recyclers can participate in an auction for e-Waste.

The auctioning process - feedback from recyclers with respect to ground realities:

Authorized recyclers that participate in MSTC auctions continue to express that the auction process is not in line with the new e-Waste rules.

They revealed that the MSTC customers continue to include e-Waste in mixed scrap. At most times only the low value e-Waste is kept aside and auctioned as e-Waste. Wherein e-Waste with high value are mixed with the consignments along with other metal scrap.

4.7.1 Issues and challenges: The auctioning process is used extensively by both the private and public sector (BSNL, BHEL, IOC etc) are all customers of MSTC.

A stringent enforcement process would ensure compliance to the new rules.

On the other hand the KSPCB should also closely monitor MSTC. This has not happened so far. In fact in a letter dated Jan 2014 - KSPCB has written to the e-Governance department requesting them to ensure that all government departments are made aware about the new e-Waste rules and comply with the same. The letter then also indicates that the department can refer to the website of MSTC for guidelines with regards to e-auctioning of their e-Waste.

It must be pointed out that MSTC has no due process for the sellers and these needs to be monitored closely.

In the circumstances KSPCB needs to issue very clear guidelines to all government departments to ensure that all e-Waste from government departments flows to authorized recyclers.

It also needs to review the processes followed by MSTC and ensure that MSTC so that it is ensured that its customers do not mix e-Waste along with other scrap.

5. SECONDARY ANALYSIS

We have attempted here to get data available with the government so as to get further insights into the generation of e-Waste and determine whether the processing and recycling capacities currently available match the generation of waste.

The secondary sources that we reached out include the secretariat, government of Karnataka and KSPCB.

The government secretariat was able to give us data with respect to the number of staff employed and subsequently the procurement of IT equipment over 10 years. Based on this data, we have made estimations to determine the quantity of e-Waste generated (we assumed that the equipment would reach end of life after 5 years)

On the other hand we received data from the Karnataka State Pollution Control Board on the current recycling capacity that the state has for recycling e-Waste. This data is correlated to the estimated quantities of e-Waste that is generated from industries across Karnataka

5.1. DATABASE ON E-WASTE GENERATION

The survey was made for the Government Departments through a questionnaire format **(ANNEXURE-XVI)**.

The objective waste analyse the generation and flow of e-Waste from the secretariat which as per the new rules is a bulk consumer.

The data on procurement of IT equipment and its disposal over the last ten years was collected from e-Governance Department. The data/information has been taken into account as a sample survey in order to have an understanding on the said matter. The detail information has been illustrated below:

Table 9: Details of the data obtained from DPAR(e-governance)

| Year | No. of IT equipments procured | | | | | | No. of IT equipments disposed | | | | | |
|---------|-------------------------------|---------|----------|-------|---------------|-------|-------------------------------|---------|----------|------|---------------|-------|
| | Computers (PCs) | Laptops | Printers | UPSs | Others if any | Total | Computers (PCs) | Laptops | Printers | UPSs | Others if any | Total |
| (1) | (2) | | | | | | (3) | | | | | |
| 2003-04 | ----- | ----- | ----- | ----- | ----- | | ---- | ---- | ---- | ---- | ---- | ---- |
| 2004-05 | 106 | 10 | 85 | 100 | 12 | 313 | ---- | ---- | ---- | ---- | ---- | ---- |
| 2005-06 | 150 | 2 | 140 | 162 | 75 | 529 | ---- | ---- | ---- | ---- | ---- | ---- |
| 2006-07 | 182 | 85 | 30 | 282 | 11 | 590 | ---- | ---- | ---- | ---- | ---- | ---- |

| Year | No. of IT equipments procured | | | | | | No. of IT equipments disposed | | | | | |
|--------------|-------------------------------|------------|-------------|-------------|---------------|-------------|-------------------------------|-----------|-----------|-----------|---------------|------------|
| | Computers (PCs) | Lap tops | Print ers | UPSs | Others if any | Total | Computer s (PCs) | Laptops | Print ers | UPSs | Others if any | Total |
| 2007-08 | 201 | 7 | 90 | 120 | 86 | 504 | ---- | ---- | ---- | ---- | ---- | ---- |
| 2008-09 | 780 | 66 | 480 | 540 | 95 | 1961 | ---- | ---- | ---- | ---- | ---- | ---- |
| 2009-10 | 610 | 24 | 504 | 610 | 19 | 1767 | ---- | ---- | ---- | ---- | ---- | ---- |
| 2010-11 | 701 | 202 | 190 | 1056 | 4 | 2153 | 102 | 33 | 32 | 90 | 54 | 311 |
| 2011-12 | 539 | 304 | 717 | 471 | 122 | 2153 | ---- | ---- | ---- | ---- | ---- | ---- |
| TOTAL | 3269 | 700 | 2236 | 3341 | 424 | 9970 | 102 | 33 | 32 | 90 | 54 | 311 |

Equipment which is over 5 years was considered to be eligible as e-Waste. Thus in 2011, 23% of computers, 34% of laptops, 13% of printers, and 17% of UPS systems is estimated to have been disposed as e-Waste. This is material that was procured during the period 2004-2007.

Discussions with concerned officials in the departments reveal that this e-Waste was transferred to the educational institutions. There is not much clarity on the tracking of this waste thereafter. In the context of the new e-Waste rules this situation now needs to be changed.

The following formula was used to estimate the volumes of e-Waste generated during the period 2004-2011

$$DisposalPercentage = \frac{Disposal\ of\ IT\ equipment\ (2011)}{Total\ procurement\ of\ IT\ equipment\ (2004 - 07)} \times 100$$

Government Departments as a bulk consumer

The secretariat alone employs 5000 people. The books also show that 8,288 Nos of only IT equipment (comprising of laptops, PCs and printers) are in use within the secretariat.

The phenomenal extent of e-Waste generated by the government becomes apparent if we now look at all the government departments which collectively have a workforce of 5.7 lakh employees and e-waste being generated 90,000 Mt/A per year, after every five years from the date of procurement.

Calculation 1: Estimate of e-waste (in No.) from Government Departments in Karnataka state.

CALCULATIONS (extrapolating)

5000 employees in secretariat uses = 8288 no. of IT equipments.

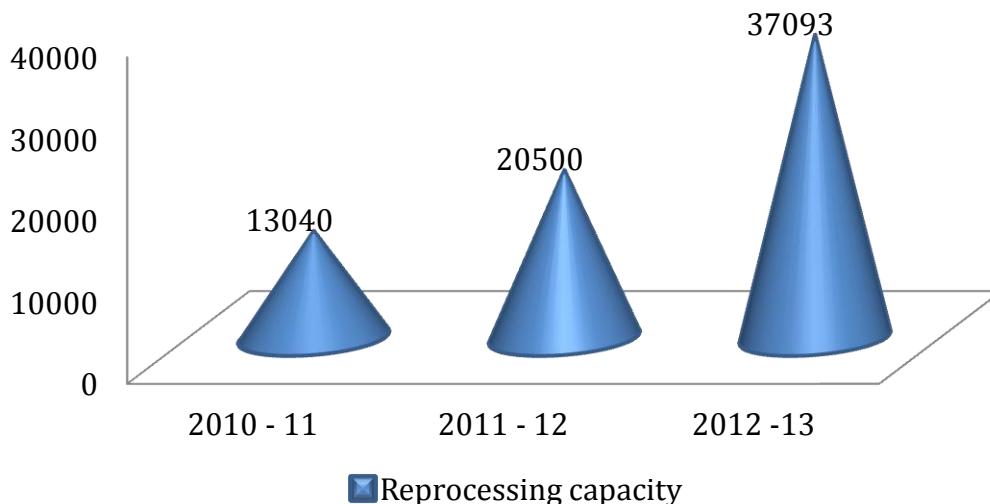
Total no. Of government employees in state is 5, 70,848(exclusive of secretariat).

Therefore, if IT equipments are in use by half of the total employees (i.e. 285424)
 = $8288 \times 285424 \div 5000$
 = 4,73,118 no. of IT equipments

Around 4 Lakhs IT equipments are in use in Government departments.
 Hence, keeping 5 years of obsolesce rate, if we estimate the no. Of equipments in Government Departments which would be eligible for disposal would come around 90 thousand, i.e every year 90,000 equipments should move out as e-waste from Government departments in the state.

5.2. CAPACITY V/S PROCESSING: IDENTIFYING THE GAPS

Karnataka has the highest numbers of formal authorized recyclers. About 34 e-Waste recyclers has been registered and authorised for collecting, dismantling and processing of e-Waste within the state. There are about 8 dismantling units (these units collect, dismantle and segregate e-Waste and then send the segregated e-Waste for processing to other authorised recycling facility) and 24 recycling units (these units collect, dismantle, segregate and recycle).



Graph 1 Capacity of Reprocessing e-waste in the State from 2010 – 13 (KSPCB data)

Table 10: Records obtained from KSPCB in regards to e-waste generation and processing

| Year | No of Industries | e- Waste generated (MT/A) | Quantity reprocessed | Authorized capacity |
|---------|------------------|---------------------------|----------------------|---------------------|
| 2011-12 | 458 | 37,000 | 1376 | 20,500 MT/A. |
| 2012-13 | 533 | ??? | NA | 37,093 MT/A |

The above table clearly shows that in 2011-12, the capacity of e-Waste to be processed in the state was 20,500 MT/A. But is this capacity sufficient? Just some basic arithmetic brings the reality home.

According to figures available with the KSPCB. In 2011-2012 there are 458 hazardous waste industries in Karnataka, who collectively produced 37,000 MT of e-Waste per year.

Calculation 2: Estimate of e-waste generated from Government Departments in Karnataka state.

| <u>CALCULATIONS</u> | |
|-------------------------------|--|
| 458 industries generates | => 37000MT of e-waste/A |
| 533 industries might generate | => $37000 \times 533 \div 458$ = 43059MT/A (estimated quantity) |

Yet a further twist comes in, when we consider that the 19 e-Waste recyclers collectively processed on 1,376 tonnes of e-Waste (2011-12) which is 4% of the estimated e-Waste generated by 458 industries alone. Going deeper, in 2012-13, 75 more industries were registered which means there are now 533 industries registered by KSPCB. Collectively e-Waste generation by these industries is expected to notch up to 43,959 tonnes per annum. If we add to this e-Waste generated by other Producers, bulk generators and the domestic sector – the gap between generation of e-Waste and processing capacity becomes unimaginable.

The quantity can be derived at around 86,118 MT/A. Nevertheless, if we look into the capacity of the state to reprocess e-Waste it does not account for such a huge generation of e-Waste. 37,093 MT/A is the capacity of the state to reprocess e-Waste, but if we look into the generation capacity it is 50 times more and this shows the lack of capacity in the state to reprocess or handle such huge generation of e-Waste.

Moreover, if we look into the reprocessing capacity from the recyclers, it shows a poor percentage of recycling by the recyclers. Based on the survey, and according to the annual returns file from the recyclers only 10 % has been achieved by the recyclers out of their capacity, for which it shows due to non-availability of e-Waste or rather due to weak/bottlenecks in the supply chain of e-Waste from the generators in the state to the recyclers.

Based on the survey, out of 34 authorised e-waste recycling units, only 14 authorised e-waste recycling units have submitted their annual reports after continuous follow ups and notice sent from KSPCB.

Similarly, out of 14 recycling units, figures from 13 recycling units indicate that they were able to process only 10% out of their total capacity. (Total capacity for 13 units is 3472MT/A, and the reprocessed capacity accounted for 31740 MT/A). And about 8 MT of e-waste has been refurbished from a single recycling unit.

The above analysis makes it clear that the capacity for recycling of e-Waste needs to be expanded. On the other hand – flows of e-Waste to the informal sector needs to be plugged.

Table 11 Annual returns filed by the recyclers for the year 2012-13

| Sl. No. | Name & Address of unit | Authorized Qty. (MT/A) | 2012-13 Returns in MT/A | HW stored | Reprocessing quantity per month | Reprocessing quantity for one year |
|---------|---------------------------------------|------------------------|-------------------------|-----------|---------------------------------|------------------------------------|
| 1 | M/s. Ash Recyclers | 120 | | | 1MT | 12 |
| 2 | M/s. E-Parisara | 8820 | 1733 | 21T | | 1733 |
| 3 | M/s. Sriram Eco Raksha Computer | 500 | | | | |
| 4 | M/s. New Port Computer Services | 500 | | | | |
| 5 | M/s. E-Warrrd & Co | 600 | 269 | | | 269 |
| 6 | M/s. K.G. Nandini Enterprises, | 7,200 | 43.823 | | | 43.823 |
| 7 | M/s. Eco Birdd Recycling Company Pvt. | 350 | 43.606 | 0.436 | | 43.606 |
| 8 | M/s. FA Enterprises | 100 | | | | |
| 9 | M/s. Ameena Enterprises, | 560 | | | | 560 |

| Sl. No. | Name & Address of unit | Authorized Qty. (MT/A) | 2012-13 Returns in MT/A | HW stored | Reprocessing quantity per month | Reprocessing quantity for one year |
|---------|--|----------------------------|--------------------------|-----------|---------------------------------|------------------------------------|
| 10 | M/s. E-R3 Solutions Pvt. Ltd | 290 | | | | |
| 11 | M/s. Trishyirya Recycling India Pvt. | 500 | | | 19MT | 228 |
| 12 | M/s. Tech Logic | 240 | 61.586 | 0.02 | | |
| 13 | M/s. Samarthanam Trust for the Disabled | 337.5 (printer cartridges) | | | | |
| 14 | M/s. Sai Recyclers | 300 | | | | |
| 15 | M/s. Nobel Technology | 300 | | | | |
| 16 | M/s. Cerebra Integrated Technologies Ltd | 600 | | | | |
| 17 | M/s. Ecovision Recycling. | 300 | | | | |
| 18 | M/s. Royal Touch | 90 | | | 14MT | 168 |
| 19 | M/s. Arrow Systems | 120 | 7.9 (ONLY REFURBISHMENT) | | | |
| 20 | M/s. Digicomp Complete Solutions Ltd, | 180 | | | | |
| 21 | M/s. AfeefaSpectro Alloys | 300 | | | | |
| 22 | M/s. H. M. G. Eco Care recycling Pvt. | 300 | 74.489 | | | 74.489 |
| 23 | M/s. E-Scrapy Recyclers | 300 | | | | |
| 24 | M/s. Eco-Ewaste Recyclers India Pvt | 300 | 38.348 | | | 38.348 |
| 25 | M/s. Epragathi | 300 | | | | |
| 26 | M/s Hindustan Computers. | 100 | | | | |
| 27 | M/s. Trackon E-waste Recyclers Pvt. | 300 | | | 3.6MT | 43.2 |

| Sl. No. | Name & Address of unit | Authorized Qty. (MT/A) | 2012-13 Returns in MT/A | HW stored | Reprocessing quantity per month | Reprocessing quantity for one year |
|---------|------------------------------|------------------------|-------------------------|-----------|---------------------------------|------------------------------------|
| | Ltd | | | | | |
| 28 | M/s Rashi E-waste | 300 | Nil | Nil | | |
| 29 | M/s. Green Globe Enterprise. | 79 | | | | |
| 30 | M/s 4R Recycling Pvt Ltd | 600 | | | 8.367MT | 100 |
| 31 | M/s TES-AMM Indian Pvt Ltd | 12000 | | | 13MT | 158 |
| 32 | E-Waste managers | 300 | | | | |
| 33 | Shobith Industry- | 300 | | | | |
| 34 | XL Engineering | 34 | | | | |

6. ISSUES AND RECOMMENDATIONS

India is known to have progressive legislation. The problem however lies with the implementation and enforcement of the rules.

It is important that the e-Waste rules 2011 do not meet the same fate of other similar legislation. It is with this intent that we have dedicated an entire chapter dealing with raising issues and recommending appropriate solutions to address the same.

The chapter also looks at possible amendments to ensure a more stringent and meaningful set of rules.

6.1. AMENDMENTS TO STRENGTHEN THE RULES

1. Auction portals: The auction companies play a significant role in channelizing e-Waste generated by bulk waste generators. The rules however, do not include guidelines or a process, to ensure that the e-Waste auctioned by their customers does not go to unauthorized recyclers.

There are huge volumes that the auction companies deal with. Their customers are, as yet, not aware about the new e-Waste rules and continue to mix e-Waste with other metal scrap. The auction companies on their part seem to ignore these lapses.

On the other hand there is no monitoring mechanism whereby the auction companies are penalized for non compliance of the rules.

- **Recommendations:** All auction companies should ensure that no e-Waste is included in the general waste/scrap. Each of their clients must be informed (with penalties for non compliance) about the e-Waste rules and the list of items in Schedule 1 which should only be auctioned as e-Waste to an authorized e-Waste recycler. The auction company must be made liable for any default from the client side. Random checks by the regulatory body, followed by penalties to the auction company are necessary.

2. Attention given to the retail chain: There is no definition or responsibility given to the Retail sector to ensure compliance to the e-Waste rules. The exchange programme which the retail sector uses to attract more customers does not provide adequate focus on authorized e-Waste management systems.

The exchange programme wins customers who feel that they can get a brand new product for a lesser cost. Brands on the other hand are happy to see increased sales and the same is true for the retail sector that widely advertises the exchange programme.

- **Recommendations:** The retail sector must be included as a bulk waste generator and must be subject to monitoring from the regulatory body. All waste which is generated through the exchange mechanism, must be accounted for, so that the same is sent to authorize recyclers.
- 3. Attention given to Schedule II items of e-waste rules 2011:** Schedule II items mainly the CFL bulbs, tungsten bulbs, tube-lights can be seen mostly in the domestic waste sector and also sometimes wastes from private sector. These wastes are exempted from e-waste category and needs to have proper guidelines for disposal. Since they have hazardous waste components, they are often seen as non-valued components and are observed to be disposed in an unscientific manner.
- **Recommendations:** These items (mainly the CFL bulbs, tube-lights etc.) must be included under EPR clause and proper guidelines should be indicated for its safe disposal under the rules. If any recyclers have facility to dispose these wastes then they should be facilitated by the regulatory authorities or producers to make the disposal viable.

6.2. IMPLEMENTATION OF THE RULES:

- 1. Review and monitoring:** Currently the compliance across the spectrum of stakeholders is very poor. This includes producers, bulk waste generators, collection agencies, recyclers and even domestic consumers
 - **Recommendations:** In order to make sure that all the stakeholders are complying with the e-Waste rules, random checks need to be conducted in the same manner as that of Hazardous waste rules.
- 2. EPR:** Producers continue to ignore the EPR aspect which is included in the regulations. Producers have as yet, not introduced a reverse logistics mechanism, whereby individual consumers can return their e-Waste to collection centers
 - **Recommendations:** Producers must be given targets with respect to the volumes of material which have been collected and recycled through authorized recyclers. These targets can be developed as a percentage of their sales.
- 3. Consumer awareness:** There is lack of understanding as to the classification of e-Waste in schedule-I. This is especially true for the domestic sector where e-Waste continues to be mixed with the Municipal Solid Waste.
 - **Recommendations:** Government authorities together with the private sector and other stakeholders need to come together to have mass awareness campaigns which will educate people about e-Waste.

4. **Bulk consumers:** e-Waste generated by bulk consumers continues to reach the informal sector through buy back schemes or auctions, which are used as mode of disposal by bulk waste generators
 - **Recommendations:** The different disposal mechanisms need to be closely watched by the regulatory body and penalties for non compliance need to be introduced.

5. **Government departments:** The government departments are also bulk waste generator. Therefore, they are also subject to the same rules with respect to flow of waste to the authorized recyclers. Currently there are no processes in place, which facilitate compliance of Government departments to the e-Waste rules
 - **Recommendations:** The Department of Environment will need to issue a Government Order that will direct all government departments to comply with the new e-Waste rules.

6. **Inventorization:** The regulatory body is bound to conduct an inventorisation of e-Waste. Currently there is no such data which is available
 - **Recommendations:** The regulatory authority needs to conduct a base line study which will make available data of e-Waste generated by different sectors. For example within the bulk waste sector, how much e-Waste does the government departments collectively generate? Likewise what is the contribution of the domestic sector? This data will help recyclers and collection agencies to plan their strategies and programmes.

7. **Collection facility:** Lack of proper collection facility through BBMP for e-Waste collection from domestic sector.
 - **Recommendations:** The BBMP has set up dry waste collection centers in each ward. These dry waste collection centers can also become e-Waste collection points. Authorized recyclers and collection agencies can service these collection points. The e-Waste collected can then be aggregated in a larger collection center, before it is sent to an authorized recycler.

8. **Filing annual returns :**It was observed that, annual returns from most of the generators and re-processors of e-Waste was not filed
 - **Recommendations:** It is the duty of the regulatory authority that once the licenses are issued there has to be a system in place in order to monitor the generators and re-processors of e-Waste. A transparent compliance system should be put in place, through electronic media, wherein the generators and the re-processors can file in all necessary documents within the given time frame. Apart from this, immediate action should be taken for suspension of licenses for about three months for the generators and re-processors, who do not file their annual returns in the given span of time.

With regards to the above mentioned issues and recommendations, the immediate step that needs to be taken is to issue a circular, which specifically directs stakeholders especially the Government Departments to comply with the rules.

Table 12 Summary of recommendations viz. Stakeholders

| Name of Stake holder | Compliance required | Monitoring recommended |
|------------------------------------|---|--|
| Producer | Transparent compliance system needs to put up in place | Target for collection of e-Waste |
| Bulk waste generator Private | e-Waste to authorised recycler. Details to be filled in Form 2 and also to get registered with KSPCB. | Random checks by KSCP. The regional offices to have details of the checking conducted. |
| Bulk Waste generator Government | Transparent compliance system needs to put up in place and shall ensure that e-waste is sent to authorised recyclers. | An agency to certify the products which are obsolete after a defined span of years. |
| Recycler | Annual returns | Licence suspension for non compliance |

It was observed that Government Departments falls under the category of bulk consumers and hence can also be termed as bulk generators. To put a system, to regulate the e-waste management from Government Departments, many circulars and GOs were issued. These circulars and GOs generally included the guidelines to be followed for disposal of e-waste through public tender/auction, if the departments opt for buy-back or direct auction of its waste (**ANNEXURE-XVII**).

The circular **ANNEXURE-XIII**, issued by e-Governance in August 2013 mentioned the longevity period of computers and other accessories, which should be considered by the departments before disposing the same. However, some of the important directives were missed out in the GOs and circulars regarding the disposal of e-waste.

However, it was felt necessary during the study to recommend to the regulatory authority (KSPCB) to issue circular to all the Government Departments which will pertain to the guidelines of e-waste rules 2011. The Government Departments need to ensure that the e-waste being disposed from their departments either through buy-back or e-auctioning, must be disposed to authorized e-waste recyclers registered under KSPCB, the circular must include this clause and it should be issued to all the Government departments through the circular from KSPCB.

7. BUSINESS MODEL FOR E-WASTE MANAGEMENT

7.1. INTRODUCTION:

Before going into business model approach, this chapter intends to focus on solid waste in general and evolution of informal sector.

Conventionally in India, 'Waste' by default was treated as something untouchable. It was partially attended to discard at a distant place and was further left neglected. However, there were some groups of people engaged in the recovery available re-useable materials out of these waste. With rapid haphazard urbanization, the voluminous quantities of wastes began to generate with diversified characteristics. These wastes began to appear in the neighbourhood causing environmental pollution and health issues in the society. These indefinable groups of people also grown to a visible size and are now identified as informal recyclers.

Various rules and laws were notified towards addressing diversified characteristics of these solid wastes [Municipal Solid Waste Management Rules 2010, Batteries (Management & Handling) Amendment Rules, 2010, Bio-Medical Waste Management and Handling Rules, 2011, E-waste (Management & Handling) Rules 2011, Plastic Waste (Management and Handling) Rules 2011, Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008] for its sound management.

With its rapidly growing appetite for electrical and electronic devices, the tide of domestically produced e-waste has set to rise substantially in India. The increased production and consumption of electronic equipment has led to a rapid growth in e-waste. When disposed off, improperly, e-waste provides for health risks and toxic environmental pollution caused due to emission of lead, mercury and other toxic compounds found in most computers and monitors.

Owing to several factors, such as the identification of e-waste as a life threatening issue, and the lack of regulation at ground level, the management of e-waste in India is still in its infancy.

Despite of the fact that e-Waste is a threat to the environment when handled unscientifically, it also offers a profitable mode of revenue generation. As informed above, some indefinable groups of people in society were into the business of waste handling but, there was no major shift in the waste handling practice with the increase in the quantity of waste generated.

Mushrooming waste generation led to the growth of informal sector of waste management which employed crude practices of waste handling and treatment.

As mentioned in the previous chapters, 90% of e-waste reaches the hands of informal sector, where the e-Wastes are handled and disposed in unscientific ways.

7.2. SLOT ANALYSIS:

The SLOT analysis was prepared within the framework of the study to try and get a broader understanding of the functioning of the informal sector to discover new opportunities and manage and eliminate threats. It focuses on evaluating the common strengths, limitations, opportunities and threats of the current system of e-Waste management.

Through this analysis, an attempt has been made to reform the informal sector to the formal sector keeping in mind a sustainable business approach both in terms of safeguarding the environment and being economically viable.

Table 13: SLOT analysis of formal and informal sector in e-waste management

| Strengths | Limitations |
|--|--|
| <ul style="list-style-type: none"> a) Huge source of e-Waste; b) Well established e-Waste collection network. c) Hands on experience ; d) Viable market for processed e-products. e) Prospect of formalisation. | <p>Awareness :</p> <ul style="list-style-type: none"> a) Lack of awareness about e-waste among e-Waste recyclers and Generators; b) Ignorance among bulk consumers like Govt. Depts, banks and others towards disposing e-Waste scientifically; c) e-Waste (Management and Handling)Rules 2011 is just 3 years old and subject is at its infancy. <p>Informal:</p> <ul style="list-style-type: none"> d) Major share of e-Waste to informal sector; e) No actions taken so far to negate informal sector; f) Established business; g) Relatively less investment; h) Informal sector sidelined. <p>Formal:</p> <ul style="list-style-type: none"> a) No proper channelization of e-Waste in the existing system to the formal sector; b) Shortage of supply of raw materials to get formalised. c) Lack of visibility for formalised e-Waste recyclers; d) Additional expenditure on formal recyclers during collection from collection centre*. e) Overburdened with overhead costs and taxes; f) Delayed issue of CFOs; g) Relatively huge investment; h) No entrepreneurial encouragement from Govt. to shift from informal to formal practices - No financial and technical support; <p>Auctioning:</p> <ul style="list-style-type: none"> i) Scrap auctioned as "e-Waste" by seller is mixed with other solid waste as well; |

| Opportunities | Threats |
|--|--|
| <ul style="list-style-type: none"> a) Sound Management of e-Waste; b) Freedom to trade without any bias; c) Recognition as an “ Authorized Recycler”; d) Legitimate to transact with e-Waste generators directly or through auctioneers. e) Ample scope for expansion, can receive e-Waste anywhere across the state; f) Recognition from Academic/Govt. Institutions for study; g) Eligible for technical and management support from Government and other institutes; if any h) Eligible for bank loan; if any i) Eligible for Govt. benefits, if any j) Eligible for Grants; if any k) Formalisation and Socio-economic up-liftment of informal sector; l) Waste to Resource -Urban electronic and electrical mining. | <p>Informal:</p> <ul style="list-style-type: none"> a) If neglected, informal will remain informal causing socio-economic and environmental damage; b) Environmental threat; c) Fosters informal practices; d) Minimum Recovery /recycling; e) Occupational Health Hazards and public health hazards; f) Security deposit that KSPCB demands as guarantee fee and other above weakness antagonise informal sector personnel to convert and work in the formal sector. <p>Formal:</p> <ul style="list-style-type: none"> g) One of the major threats of the industry is not being able to break-even in the stipulated time frame thereby adding to the owes of loans and debt*; h) Smaller share of e-Waste among Formal sector and hence, tight competition; i) Shifting of the unit/setup after lease/rent period; j) Hampers formal sector growth capacity. |

Addressing the issue at hand:

Businesses face huge environmental and social challenges, in the current situation, where they operate. Having said that, business models driven purely by profit, with no regard to environmental impact and no recognition of the social value of goods and services, will not be sustainable.

Informal practices in retrieving resources from e-Waste are damaging both the health of the environment and that of the individual, besides generating low revenue. It is important to take into confidence the informal recyclers, so that they have a better understanding on how to deal with e-waste in a scientific manner, in addition to being economically viable / independent.

7.3. SUSTAINABLE BUSINESS MODEL FOR E-WASTE:

A business model describes the rationale of how an organization creates, delivers, and captures value, in economic, social, cultural or other contexts.

A sustainable business approach would require major stakeholders such as the manufacturers, vendors and distributors of electronic and electrical goods and e-waste handlers are aligned to manage e-waste effectively.

Following aspects are being considered towards developing a sustainable business model:



- a) Marketing and Awareness:** Traditionally, waste generated was in relatively small quantity but, due to rapid change in lifestyle and Urbanization has lead, not only for the increase in the quantity of e-Waste but also diversified the same. Though rules were notified timely, but the same could not be implemented as there was ignorance on part of waste management among society. Also it seems that current institutionalization setup does not ensure necessary level of awareness among various stakeholders viz.

Table 14 Necessary information for stakeholders

| Sl. No. | Stakeholders | Necessary information |
|---------|--|---|
| 1. | Producers/Manufactures | <ul style="list-style-type: none"> a. Ensure complete knowledge on e-Waste (handling & Management) Rules, 2011 b. About authorised recyclers; c. Extended Producer Responsibility; d. e-Waste Rules, 2011 implementation guidelines. |
| 2. | Sellers/Distributors | <ul style="list-style-type: none"> a. should be aware of how to deal with 'end of life' products and b. Authorised recyclers |
| 3. | Domestic e-Waste Generators (household and commercial) | <ul style="list-style-type: none"> a. Should be aware of waste segregation and disposal to designated collectors. |
| 4. | Bulk e-Waste Generators | <ul style="list-style-type: none"> a. Should be aware of scientific in-house collection and disposal method and b. About recyclers |
| 5. | Recyclers | <ul style="list-style-type: none"> a. Ensure complete knowledge on e-Waste (handling & Management) Rules, 2011 and b. Standard operating procedures. c. e-Waste Rules, 2011 implementation guidelines. d. Financial and technical support, if any |

Hence, acquaintance with the above necessary information would be essential towards building strong base for environmentally sound e-waste management.

The society at large also has a major role to play as far as contributing to a sustainable business approach is concerned. However, this can only happen if the society is sensitised about delicate issues such as disposal of e-waste in a scientific manner. Awareness among the general public can also be created through various sources of mass media, such as newspapers, radio, Television and also through the internet. Educating workers on the safe collection and recycling of e-waste also needs to be imparted. Training programmes can be undertaken for professionals in the field of e-Waste.

Besides providing stakeholders with adequate information regarding how they can dispose their e-waste scientifically, there is also a need for the manufacturers to go the extra mile in terms of Extended Producer Responsibility (EPR).

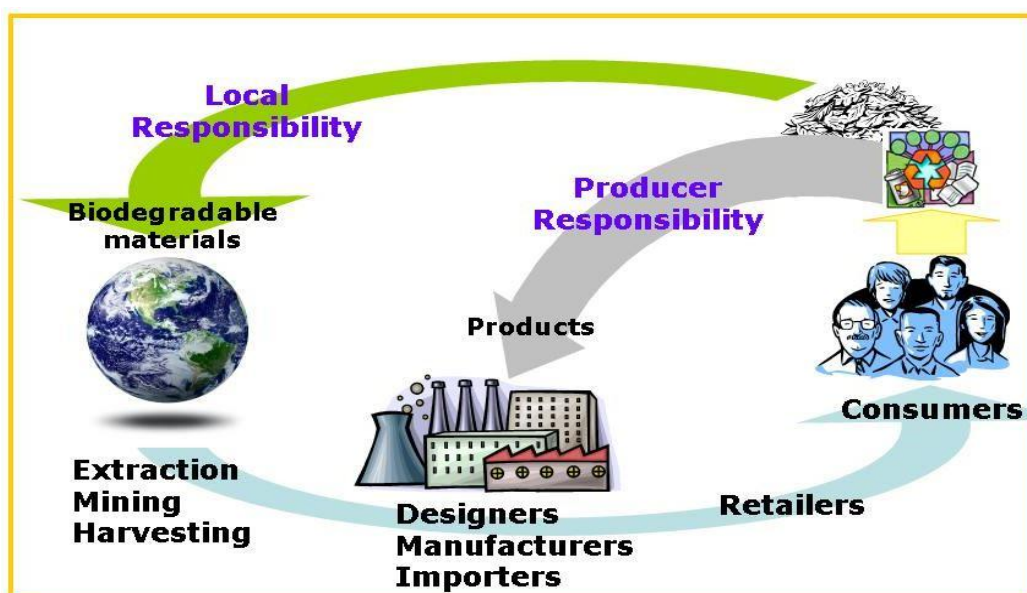
In addition to protecting the environment, the model is aimed at creating thousands of green jobs for people who work at the informal sector at the facility and across supporting logistics and collection networks, in part, by converting existing informal-sector e-waste “pickers” into trained and compensated e-waste collectors.

Awareness and recyclers visibility should primarily change the mindset of e-Waste generators towards scientific disposal and to ensure increase in adequate channelization and efficient collection of e-Waste by authorised recyclers.

b) e-Waste supply chain: There exists a well-established supply chain network facilitating the informal sector. In view of channelizing supply chain to formal sector following interventions are necessary:

- **Extended Producer Responsibility:** In the supply chain of e-Waste, the major driving force should be from the producers and Manufactures. At the first place, manufactures has to strictly follow RoHS compliance towards reducing the refuse (toxic) generation after recycling. And **Extended Producer Responsibility (EPR)**, a policy approach also called as “manufacturer take-back” makes manufacturers responsible for managing their products and packaging when consumers are finished with them, plays a fundamental role towards e-Waste handling and management as a whole.

With producer responsibility, manufacturers have an incentive to design their products to use less material, last longer, be reusable, and be recycled at the end of their useful life – turning what was formerly “waste” into the “food” for industry and the next generation of products.



- **Domestic e-Waste Generators:** Following are the some of the causes affecting supply chain to formal sector by e-Waste Generators:
 - a. Ignorant about e-waste disposal mechanism
 - b. Out of sight is out of mind attitude of e-Waste generators – letting e-Waste flow in municipal solid waste and to informal sector;
 - c. Informal sectors are conventional buyers of e-waste;
 - d. Informal sectors (*kabadiwala*) widely known among source of e-Waste generators.

As far as domestic e-Waste is concerned, as already mentioned in previous chapter, following major source of collection system needs proper intervention for better channelization towards supply of e-Waste to formal sector:

- a. *kabadiwalas* in the given locality needs to be identified, registered and to be checked for channelization of e-Waste to formal sector and
- b. Also Municipal Solid Waste collectors has to be well informed about the segregated e-waste collection and its disposal to formal sector;

Bulk Generators usually dispose e-Waste through auctioning. e-Waste is an asset, considered as component of revenue and prioritised for scientific disposal. Also, information has been shared by the recyclers that the e-Waste received from the Bulk Generators would also contain other waste, in general.

A system should be institutionalised with strong legislation and necessary accounting at every stage of disposal of e-waste from bulk generators to ensure supply of segregated e-Waste to formal sector. Defaulters among bulk generators can be penalised for disposing e-Waste to informal sector.

Auctioneers: Auctioneers are the interface between bulk generators and recyclers. They play pivotal role in the supply chain. However, Auctioneers find no mention in e-Waste (Management and Handling) Rules, 2011 which has led to major setback in the current supply chain.

Auctioneers have to be well informed about the e-Waste (Management and Handling) Rules, 2011 and should ensure that any e-Waste disposal is as per the rules and definitions. The whole process of auctioning should be in spirit of better waste management rather than be regarded as a money making system.

Overall supply chain should be made online, to the extent possible, towards ensuring fair business practices and scientific e-waste disposal.

Recyclers: As per Karnataka State Pollution Control Board (KSPCB), it has been suspected that some of the formal recyclers are collecting e-Waste more than their authorised capacity. Hence, there is a need for a monitoring system to be in place towards ensuring no excess collection of e-Waste beyond authorised capacity by any of the formal recyclers. This would ensure judicious supply of e-Waste among the formal sector.

c) Efficient recycling: is attempted to assess value recovered out of total e-Waste generated. In view of estimating the value recovery of the total e-Waste generated,

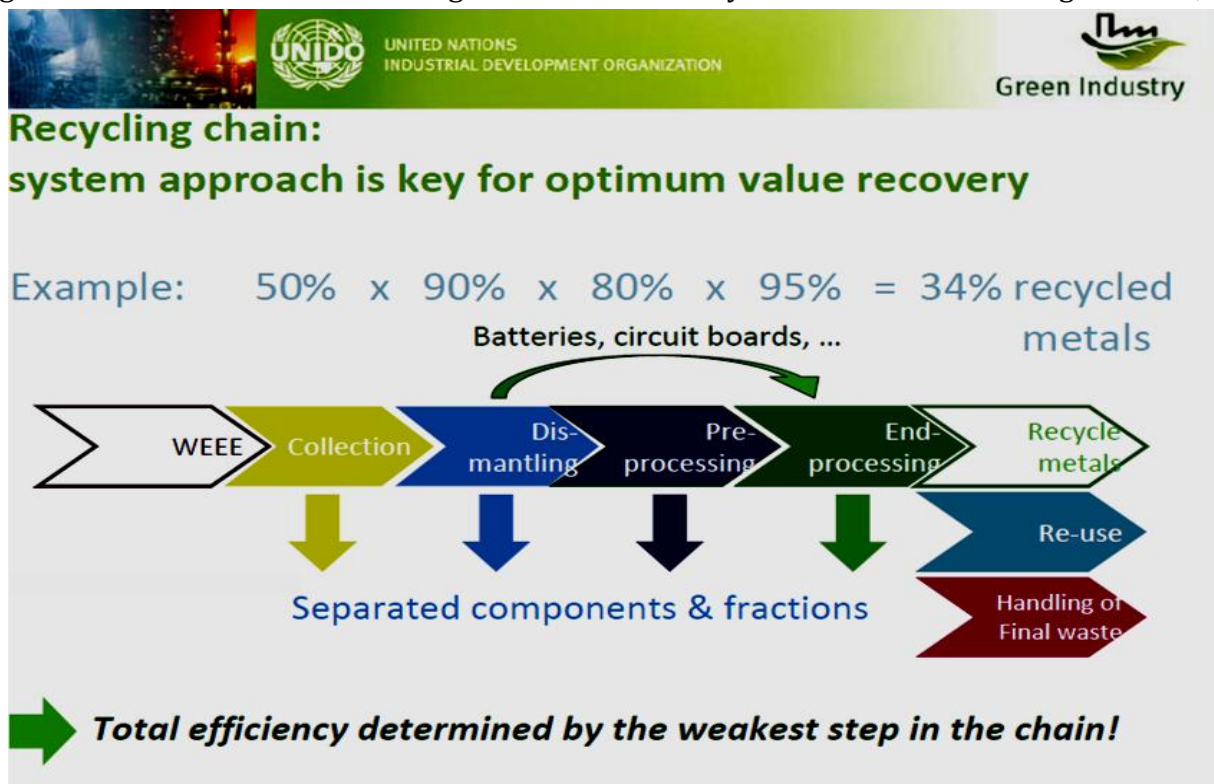


Figure 8 Recycling Chain

Source: United Nations Industrial Development Organisation, GMS Training workshop on e-Waste, 2012, Sustainable business model involving SME's

'Recycling Chain' which includes different stages of recycling viz. collection, dismantling, pre-processing and end-processing is adapted from the UNIDO study. As indicated in the UNIDO study, efficiency of different stages of recycling, except for collection is considered as mentioned below:

Dismantling – 90% efficiency

Pre-processing - 80 % efficiency

End-processing - 95% efficiency

Studies indicate in 2007, 5%⁴ of the total e-Waste generated reached formal sector and in 2010 it doubled to 10%⁵.

With the 5% of collection efficiency of the total e-Waste generated, value recovery achieved would be just 3.4%.

$5\% \text{ collection} \times 90\% \text{ dismantling} \times 80\% \text{ pre-processing} \times 95\% \text{ End-processing} = 3.4\% \text{ value recovery.}$

Similarly, with 10% of collection efficiency value recovered would be a mere 6.8%. Hence, the value recovered out of total e-Waste generated was just 3.4% in 2007 and 6.8% in 2010. ⁶Dismantling and processing (pre & end) efficiency are borrowed from the fig. 1, of UNIDO, presuming that the same degree of efficiency is achieved in the local context as well. Hence, it is evident that, despite having high dismantling and processing efficiency, adequate **collection system/ raw material supply** is a deciding factor for efficient value recovery out of total e-Waste generated.

And in order to see that the system is working to its maximum efficiency following aspects has to be considered by the recycler:

- a. Business strategy or Terms of references
- b. Waste audits- for quantitative and qualitative assessment
- c. Standard Operating Procedures & skilled labour
- d. Monitoring – high value recovery and environmental safety;
- e. Heavy duty machinery can be setup for long life efficiency.

Preparation of Waste Audit report jointly by both the generators and collectors/recyclers should be mandated, providing information regarding:

- a. Type of waste collected and its quantity,
- b. Treatment method to be subjected – standard dismantling and recovery process; and Refuse disposal.
- c. Quantity of e-products & e-components recycled and recovered out of collected e-Waste and quantity of refuse generated. Recovery is to Refuse ratio (Recovery: Refuse) out of total e-Waste treated and
- d. Other necessary information, if any

⁴ GIZ, 2007

⁵ ASSOCHAM, 2010

⁶ Link for figure 1: http://www.uncrd.or.jp/env/spc/docs/120710Day3_Tech_Session2_Stucki.pdf dated 25/03/2014

d) Environment Safeguarding: e-Waste treatment is practiced to check the environmental pollution caused by it. But, intense practice of crude and unscientific methods would not treat waste but will add to the degradation of the environment. Informal sector tends to contaminate groundwater, soil and cause air pollution. Hence, formal/scientific practices with necessary infrastructure viz. non-permeable surface area, dust collector and scientific disposal of hazardous waste (by-products) will not only safeguard the health of the environment but also pave way for Urban resource mining, leading to a new source of wealth.

Formal practices will also ensure no/minimum occupational health hazard, inturn, will offer a better way of life.

The most popular methods for managing e-waste can be led by the industry itself. They involve extending the lifecycle of electronic products in order to reduce e-waste and the hazards associated with recycling and disposal. Thus refurbishment and reuse will gain popularity in the sector. The fact is that e-waste recycling is expensive and the costs are not necessarily recovered by the sale of the recovered materials.

Reductions in toxic elements help in minimising the refuse. Formal practices ensure scientific and efficient repair/refurbish and recycle, which inturn enables reusability, recovery of resource and revenue generation. Hence, business model propose the following as long-term strategy.

In pursuance of RoHS, Reduction in the hazardous waste during the manufacture of electrical and electronic appliances will generate fewer by-products (refuse) during the recycling process.

This could in turn favour convenient repair and recycling thus facilitating high value recovery. This in turn will favour health revenue generation besides value addition and also safeguard the environment.

“Reduction + Refuse + Repair + Reuse + Recycle + Recover = Revenue +Value Addition +Environmental safeguard”.

7.4. BUDGET:

In consultation with recyclers, who have converted from informal to formal, it was known that equipments such as Dust Collectors, Scrubber and Lab for analysis of effluent (liquid/gas) would combat environmental pollution. As far as material recovery from e-Waste is concerned, necessary space, skilled labour and setting up of Furnace & flux-cast-mould, would ensure efficient value recovery. With the above mentioned arrangements, an approximate collection capacity of 300 MT per year would be essential for promising income and long-term prospects. Besides this, it was also found that out of 34 registered recyclers, 12 were found to have a processing capacity of 300 MT.

In this premise, it was felt that a recycling unit with the capacity of 300 MT would be close to an ideal scenario for an informal player to convert as a formal sector player.

Hence, an attempt is made to develop an estimated project budget for authorization capacity of 300 MT with essential infrastructure requirements to run an environmentally sound recycling unit.

Project budget particulars were identified in 4 groups Viz.

- 1) Land and Civil works: includes cost of the land on lease basis and civil works as infrastructure setup inclusive of general amenities;
- 2) Operating Machinery and equipment: includes Pollution control equipment, waste processing machineries and lab;
- 3) Other financial expenses: includes Project design charges, processing fee and other preliminary working expenses and
- 4) Working Capital;

With the above said arrangements to start a recycling unit, a budget estimate of Rs. 40 lakhs was arrived at.

Table 15 Project Cost

| # | Particulars | Units | Qty | Amount Rs. Lakhs |
|----------|--|-------|--------|------------------|
| 1 | Civil works | | | |
| a. | Land - lease deposit | Sqm | 222.96 | 5.00 |
| b. | Buildings - no separate investment | | | |
| | Interiors & Furniture | Sqm | 14.00 | 2.50 |
| | Septic tank and soak pit | Nos | 1.00 | 0.50 |
| | water sump | Nos | 1.00 | 0.25 |
| | Total | | | 8.25 |
| 2 | Operating machinery and equipments | | | |
| a. | Dust extractor system | No. | 1.00 | 5.50 |
| b. | Scrubber | No. | 1.00 | 6.00 |
| c. | Lab | No. | 1.00 | 2.00 |
| d. | Furnace and Flux and casting moulds | No. | 1.00 | 4.60 |
| | Total | | | 18.10 |
| 3 | Other Financial Expenses | | | |
| a. | Preliminary expenses (DPR, investigations, prelim designs etc) | Rs. | 0.60 | 0.60 |
| b. | Financial charges (Bank guarantee, processing fees, admin fees, legal expenses) | Rs. | 0.50 | 0.55 |
| c. | KSPCB-safety deposit | Rs. | 1.00 | 1.00 |
| | Total | | | 2.15 |
| 4 | Initial working capital | | | 11.50 |
| | GRAND TOTAL | | | 40.00 |

Further to the estimation of project cost, means of finances were sought for. E-Waste recycling units are often considered as Small Medium Enterprises (SMEs industry) and under this recognition they can claim for loan from banks with 60:40 debt & equity ratio as per the standard banking norms.

Though there is a mention of subsidy for e-Waste recyclers (*as per Ministry of Environment & Forests (MoEF), GoI vide No. 20-3/2008- HSMD dated 4th August 2010*) no one ever availed the benefit. Besides, Central Govt. Subsidy is subjected to various terms and conditions (**ANNEXURE- VIII**) which requires more clarity as for as accounting part is concerned. Hence, Govt. Source of subsidy/Grants were listed under the means of finance as below are not taken into account.

Table 16 Means of Finance

| # | Source | Terms | Amount in Rs. |
|----------|------------------------|-------|---------------|
| 1 | Grants | | |
| a. | GoI | | |
| b. | GoK/KIADB | | |
| c. | Industries | | |
| 2 | Private equity | | 16.00 |
| 3 | Debt | | |
| a. | Banks | | 24.00 |
| b. | Interest rates | 15% | |
| c. | Repayment period years | 5 | |
| d. | Moratorium years | 0 | |
| | Total | | 40.00 |

Thus, in consideration with common financing provisions that are offered for SMEs by the majority of banks were studied and listed as below:

1. With a capital/one time investment of Rs. 40 lakhs without any subsidy from Govt;
2. Debt, Equity ratio of 60:40 is considered i.e 24 lakh Debt and 16 lakhs Equity
3. 15% on Interest on Debt;
4. Debt payment term of 5 years i.e. 60 months.

However, it was informed by the recyclers, that banks do not seem to have enough clarity to arrive at the basis to offer the loans for the recycling sector. Hence, obtaining approval for loan has become a cumbersome process.

Subsequent to the investments, basic compositions of e-Waste recyclables of 1 MT e-Waste was listed in consultation with recyclers and referring to Detailed Project Report (DPR). Selling prices for these recyclables were also obtained by recyclers.

Table 17 Sale value for e-Waste recyclables (1MT = 1000 kgs)

| # | Composition of e-Waste recyclables | Composition by weight in grams | Sale Value Rs./MT | Sale Value in (Rs.) |
|----|------------------------------------|--------------------------------|-------------------------|---------------------|
| 1 | Iron scrap | 543.87 | 25,000.00 | 13,596.8 |
| 2 | Brass scrap | 16.63 | 1,80,000.00 | 2,993.39 |
| 3 | Copper scrap | 48.85 | 4,60,000.00 | 22,471.21 |
| 4 | Aluminum scrap | 181.28 | 1,20,000.00 | 21,753.21 |
| 5 | Working LCD screens | 12.47 | 1,05,882.00 | 1,320.60 |
| 6 | Steel scrap | 45.32 | 24,000.0 | 1,087.59 |
| 7 | Working printed circuit boards | 36.13 | 2,00,000.00 | 7,225.71 |
| 8 | ICs / Capacitors / Resistors | 2.23 | 22,500.0 | 50.28 |
| 9 | Gold | 0.01 | 28,74,000.00 | 29,871.53 |
| 10 | Silver | 0.21 | 48,60,000.00 | 10,102.69 |
| 11 | Plastic | 103.94 | 7,000.00 | 727.56 |
| | Total | 1000.00 | 2,923,724,382.00 | 111200.60 |

Extrapolating the selling prices of 1MT e-Waste recyclables with 300 MT/year i.e. when 100% collection or supply of raw material (e-Waste) is achieved, it was found that a total turnover of Rs. 304 lakh in the 1st year. Subsequently, it was assumed that there will be a 5% increase in turnover every year.

Table 18 Turnover of recyclables

| Sl. No. | Recyclables | Selling price/ MT in Rs. | Selling price for 300 MT Rs. In Lakh | | | | |
|---------|--------------------------------|--------------------------|--------------------------------------|----------------------|----------------------|----------------------|----------------------|
| | | | 1 st year | 2 nd year | 3 rd year | 4 th year | 5 th year |
| 1. | Iron scrap | 13,596.8 | 40.79 | 3,19.54 | 3,35.51 | 3,52.29 | 3,69.90 |
| 2. | Brass scrap | 2,993.39 | 8.08 | | | | |
| 3. | Copper scrap | 22,471.21 | 60.67 | | | | |
| 4. | Aluminium scrap | 21,753.21 | 58.73 | | | | |
| 5. | Working LCD screens | 1,320.609 | 3.57 | | | | |
| 6. | Steel scrap | 1,087.598 | 2.94 | | | | |
| 7. | Working printed circuit boards | 7,225.71 | 19.51 | | | | |
| 8. | ICs, Capacitors, Resistors | 50.27959 | 0.14 | | | | |
| 9. | Gold | 29,871.53 | 80.65 | | | | |
| 10. | Silver | 10,102.69 | 27.28 | | | | |
| 11. | Plastic | 727.56 | 1.96 | | | | |
| | Total income | 1,11,200.6 | 3,04.32 | | | | |

However, there are some expenses which need to be incurred from the turn over to calculate profit.

In this relation, Expenses viz.

- Operation & Maintenance (O&M) expenses,
- Bank debt. interest rate,
- Depreciation cost and
- Other financial expenses were considered and estimated as below:

a. Operation & Maintenance (O&M) expenses

Table 19 Operation & Maintenance Expenses

| Year | Particulars | Wages and salary | Rent | Electricity | Transportation | Consumables & Other admin cost | Processing costs | Raw Material purchase | Total (Rs.) in Lakhs |
|----------------------|----------------|------------------|------|-------------|----------------|--------------------------------|------------------|-----------------------|----------------------|
| 1 st year | O & M expenses | 19.80 | 6.00 | 3.00 | 9.60 | 3.04 | 9.13 | 228.24 | 278.81 |
| 2 nd year | | 20.79 | 6.30 | 3.15 | 10.08 | 3.20 | 9.59 | 239.65 | 292.75 |
| 3 rd year | | 21.83 | 6.62 | 3.31 | 10.58 | 3.36 | 10.07 | 251.64 | 307.39 |
| 4 th year | | 22.92 | 6.95 | 3.47 | 11.11 | 3.52 | 10.57 | 264.22 | 322.76 |
| 5 th year | | 24.07 | 7.29 | 3.65 | 11.67 | 3.70 | 11.10 | 277.43 | 338.90 |

Operation and Maintenance expenses includes both Fixed – *Wages and Salary, Rent, Electricity and transport* and Variable cost- *Consumables & other admin, processing & raw materials purchase*. Fixed costs are those which have to be incurred irrespective of collection efficiency.

A total of 10 employees comprising Chief Executive Officer, Accounts Assistant, Marketing Executive, Technicians, Service Engineers and Material handler have been accounted for and Rent, electricity & regular transport in search of e-Waste will have to be invested towards ensuring efficient collection.

As per recyclers, above are the mandatory annual expenses towards achieving promising business out of 300 MT capacity of recycling unit. An inflation rate of 5% is considered for arriving at subsequent years cost.

b. Bank debt. interest rate

As per the bank norms for the SMEs, recyclers will have to repay the interest (fixed burden) as per below mentioned table.

Table 20 Bank Debt. Interest – Financial cost

| Particulars | Principal Amount | Year | Interest (Rs.) in Lakhs |
|--|------------------|----------------------|-------------------------|
| Bank Debt. (interest) – Financial cost | 24 lakhs | 1 st year | 3.37 |
| | | 2 nd year | 2.80 |
| | | 3 rd year | 2.20 |
| | | 4 th year | 1.40 |
| | | 5 th year | 0.50 |

Source : Bank of Baroda

c. Depreciation cost

“Straight line method” of depreciation is adapted for calculation of depreciation (normal wear and tear) of below mentioned (particulars) infrastructure. Where total cost is multiplied with applicable depreciation rate as per Income Tax Act 1961.

Table 21 Depreciation

| Particulars | Furniture & Interiors | Septic tank and Soak pit | Water sump | Dust Collection system | Scrubber | Lab | Furnace and Flux and casting moulds | Total depreciation (Rs.) in Lakhs |
|--|-----------------------|--------------------------|--------------|------------------------|-------------|-------------|-------------------------------------|-----------------------------------|
| Total Cost | 2.5 | 0.50 | 0.25 | 5.50 | 6.00 | 2.00 | 4.60 | 21.35 |
| Depreciation Rate | 0.10% | 0.10% | 0.10% | 0.15% | 0.15% | 0.15% | 0.15% | |
| Depreciation during 1st year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 2 nd year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 3 rd year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 4 th year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 5 th year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 6 th year | 0.25 | 0.05 | 0.025 | 0.83 | 0.90 | 0.30 | 0.69 | 3.04 |
| 7 th year | 0.25 | 0.05 | 0.025 | 0.55 | 0.60 | 0.24 | 0.25 | 2.15 |
| 8 th year | 0.25 | 0.25 | 0.025 | | | | | 0.32 |
| 9 th year | 0.25 | 0.25 | 0.025 | | | | | 0.32 |
| 10 th year | 0.25 | 0.25 | 0.025 | | | | | 0.32 |

Table 22 Other Expenses (in lakhs)

| Other Mandatory Expenses written off | Preliminary expenses (DPR, investigations, prelim designs etc) | Financial charges (Bank guarantee, processing fees, admin fees, legal expenses) | Total expense written off |
|--------------------------------------|--|---|---------------------------|
| 1 st year | 0.12 | 0.11 | 0.23 |
| 2 nd year | 0.12 | 0.11 | 0.23 |
| 2 nd year | 0.12 | 0.11 | 0.23 |
| 3 rd year | 0.12 | 0.11 | 0.23 |
| 4 th year | 0.12 | 0.11 | 0.23 |
| 5 th year | 0.12 | 0.11 | 0.23 |

Summation of the all the above expenses incurred during 1st year are Rs. 285.45 lakh and is indicated below table:

Table 23 Overall Expenses

| Sl. No. | Expenses | 1 st year | 2 nd year | 3 rd year | 4 th year | 5 th year |
|--------------|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1. | O & M expenses | 278.81 | 292.75 | 307.39 | 322.76 | 338.90 |
| 2. | Bank Debt. (Interest) | 3.37 | 2.81 | 2.16 | 1.40 | 0.53 |
| 3. | Depreciation | 3.04 | 3.04 | 3.04 | 3.04 | 3.04 |
| 4. | Other Expenses | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| Total | | 285.45 | 298.83 | 312.82 | 327.43 | 342.70 |

Table 24 Accounting evaluation for 300 MT

| Sl. No. | Collection / year | Turnover in lakhs (Rs.) | Expenses in lakhs (Rs.) | Profit before Tax in lakhs (Rs.) | Profit after tax in lakhs (Rs.) | Breakeven in Period in Months | Return on Investment in % |
|---------|-------------------|-------------------------|-------------------------|----------------------------------|---------------------------------|-------------------------------|---------------------------|
| 1. | 300MT | 304.32 | 285.45 | 18.87 | 13.20 | < 8 | 27.76 |
| 2. | | 319.54 | 292.75 | 20.71 | 14.49 | < 8 | 24.97 |
| 3. | | 335.51 | 307.39 | 22.70 | 15.88 | < 8 | 22.95 |
| 4. | | 352.29 | 322.76 | 24.86 | 17.39 | < 8 | 21.43 |
| 5. | | 369.90 | 338.90 | 27.21 | 19.04 | < 8 | 20.29 |

With this income of Rs.304.32 lakh and with operation and maintenance expenses of Rs. 285.45 lakh, breakeven can be achieved within 8 months. Table 22 also indicate that gradual increment in the profit can be achieved.

However, a minimum supply of 193 MT (64% of 300MT) is essential to breakeven in one year. And also, it is evident from the below table that the collection capacity of 193 MT would be with no profit for one year.

Table 25 Accounting evaluation for 193 MT

| Sl. No. | Collection / year | Income in lakhs (Rs.) | Expenses in lakhs (Rs.) | Profit before Tax in lakhs (Rs.) | Profit after tax in lakhs (Rs.) | Breakeven in Period in Months | Return on Investment in % |
|---------|-------------------|-----------------------|-------------------------|----------------------------------|---------------------------------|-------------------------------|---------------------------|
| 1. | 193 MT | 214.62 | 214.58 | 0.032 | 0.022 | 12 | 00.06 |
| 2. | | 225.35 | 218.34 | 0.926 | 0.65 | 12 | 2.02 |
| 3. | | 236.62 | 229.26 | 1.927 | 1.35 | 12 | 4.68 |
| 4. | | 248.45 | 240.73 | 3.049 | 2.13 | 12 | 8.37 |
| 5. | | 260.87 | 252.76 | 4.311 | 3.02 | 12 | 13.61 |

But, if the collection capacity is 74 MT per year (*as per one of the recyclers Annual Returns submitted to KSPCB*), with above mentioned project cost of Rs. 40 lakhs and along with annual fixed costs & other expenses will only lead to incurrance of loss. Hence, any collections lower than 193 MT will only discourage recycler to quit formal practice of e-Waste recycling.

But there are some of the major concerns that need to be looked into before expecting individuals to take up the recycling with 40 lakh investment are as mentioned below:

1. An investment capacity of Rs. 40 lakhs is a huge amount for any informal recycler;
2. Going by the bank norms of 60:40 ratio on 40 lakhs, 40 % equity (private funding) from the investor is economically challenging;
3. Moreover, bank may not facilitate loan as they would not have tangible or intangible assets for surety;
4. Private land may not be allowed to utilize for e-Waste management;

Taking all the above mentioned aspects into consideration the following provisions have to be facilitated to encourage entrepreneurial spirit among e-Waste recyclers

- a. Easy bank loan facility
- b. Land provision
- c. Consistency in raw material supply
- d. Subsidy on machineries

In relation to above provisions, Ministry of Environment and Forests (MoEF) vide D. O. No. 20-3/2008-HSMD dated 4th August, 2010 has setup following criteria:

- a. The total cost of the project would not include the cost of land for calculation of central subsidy
- b. The cost of land if provided by the state Govt. will be considered for inclusion in the matching contribution of the state Govt.
- c. The computation of the value of the land would be based on the current Govt. valuation notified by the competent revenue authorities
- d. However, state Government matching contribution would not include the cost incurred by it for the infrastructure development;
- e. While considering grants of central subsidy, preferences will be given to proposal where state govt. provides matching financial contribution over and above land provided free of cost or at concessional rate;
- f. The central subsidy will be provided based on the techno economic feasibility study of the project. The Detailed Project Report (DPR) prepared by the entrepreneur would be appraised by an Independent empanelled agency. This agency will also be entrusted with the 3rd party evaluation during implementation of the project.
- g. A copy of NOC or Consent to establish issued by SPCB concerned would be required to be submitted along with the proposal.
- h. The 1st instalment of the central subsidy would be released only after receiving the commitment from the state government/SPCB regarding its matching contribution and subsequent central releases would be sanctioned only after the matching financial contribution of the state government has be released
- i. The entrepreneur should submit a commitment to contribute the balance amount required for the project, along with a statement providing details of availability of the funds towards this contribution;
- j. The proposal should provide detailed time-frame for completion of the project and various components thereof.
- k. The revised pattern of the central subsidy will be available for new facilities or for expansion of existing facilities

It is evident from the above criteria that central government insists on strong commitment of state government and also recyclers.

As per the data obtained (ref. Chapter 5) recycling provision in the formal sector is made for a conservative estimate of 42% of total e-Waste generated in the state. But the rest of more than 58% of the e-Waste could be reaching the informal sector or is piled up unattended at the source of generation due to inadequate capacity of treatment. On these lines, about 163 recycling units with the capacity of 300 MT are required to manage rest of e-Waste (58%) in an environmentally sound manner.

Hence, the magnitude of the situation can only be realized if the state government/SPCB acts in a proactive manner there by intervening and providing necessary support towards ensuring that the subsidy from the central government can be utilized to its fullest capacity.

As observed, informal players will find it difficult to venture into such a large project individually, joint ventures among informal players would not only help them to sustain themselves economically, it will also be beneficial towards the society at large in the long run.

This is proposed in view apart better channelization of e-Waste from informal collectors.

Recommendations:

- a. Ward-wise identification and registration of *kabadiwala* (Scrap dealers) to take into account major source for informal sector.
- b. Encouragement of Joint ventures by existing informal players and support by Govt. (PPP) – technology /space/financing.
- c. KSPCB Security deposit in proportion to the recycling capacity of unit.
- d. Generators (Bulk consumers) shall prepare audit before disposal of e-Waste and should indicate identified method of treatment for the respective e-Waste generated.
- e. Authorised recyclers shall submit bid along with the treatment capacity and technology for receiving e-waste.
- f. Generators/ Auctioneers shall invite only KSPCB authorized recyclers for auction.
- g. e-Waste recycling can be identified as “Green business” and hence, possible subsidies should be made available from the Government.
- h. Identification of registered land in industrial area for setting up of recycling unit.
- i. All kind of business transactions as far as e-Waste collection, storage, recycling information has to be made available through on-line portal.

ANNEXURE-I

FORM – 1

[See rule 9(2)]

**APPLICATION FOR OBTAINING AUTHORIZATION FOR GENERATION/
COLLECTION/STORAGE/DISMANTLING/RECYCLING/ OF E-WASTE ***

From:

To:
The Member Secretary,
..... Pollution Control Board orPollution Control Committee
.....
.....

Sir,

I/we hereby apply for authorization/renewal of authorization under rule 11(2) and 11(6) of the E-wastes (Management and Handling) Rules, 2011 for collection/storage/transport/treatment/disposal of e-wastes.

For Office Use Only

Code No. :

Whether the unit is situated in a critically polluted area as identified by Ministry of Environment and Forests (yes/no) :

To be filled in by Applicant

Part – A : General

1. (a) Name and full address, telephone nos. e-mail and other contact details of the unit:
(b) Authorization required for (Please tick mark appropriate activity/ies*)
 - (i) Generation*
 - (ii) Collection*
 - (iii) Dismantling*
 - (iv) Recycling*

(c) In case of renewal of authorization previous authorization no. and date
 2. (a) Whether the unit is generating or processing e-waste as defined in the E-wastes (Management and Handling) Rules, 2011.
-

* Strike off whichever is not applicable

- (i) Generating*
 (ii) Processing*

3. (a) Total capital invested on the project :
 (b) Year of commencement of production :
 (c) Date of grant of the Consent to Establish :
 (d) Date of grant of the Consent to Operate :

Part – B : e-waste

4. E-waste details:

| | | |
|-----|---|--|
| (a) | Type of e-waste generated as defined under the e-wastes (Management and Handling) Rules, 2011 : | |
| (b) | Total Quantity e-waste handled generated/collected dismantled/recycled : | |
| (c) | Mode of storage within the plant : | |
| (d) | Method of treatment and disposal : | |
| (e) | Installed capacity of the plant : | |

Part – C : Dismantling and Recycling Facility

5. Detailed proposal of the facility (to be attached) to include:
- (i) Location of site (provide map)
 - (ii) Details of processing technology
 - (iii) Type and Quantity of waste to be processed per day
 - (iv) Site clearance (from local authority, if any)
 - (v) Utilization of the e-waste processed
 - (vi) Method of disposal of residues (details to be given)
 - (vii) Quantity of waste to be processed or disposed per day
 - (viii) Details of categories of e-waste to be dismantled/processed
 - (ix) Methodology and operational details
 - (x) Measures to be taken for prevention and control of environmental pollution including treatment of leachates
 - (xi) Investment of Project and expected returns
 - (xii) Measures to be taken for safety of workers working in the plant

Place : _____

Signature : _____

(Name) : _____

Date : _____

Designation: _____

ANNEXURE-II

FORM – 2

[See rules 4(8), 5(5) and 9(5)]

FORM FOR MAINTAINING RECORDS OF E-WASTE HANDLED/GENERATED

Quantity in Metric Tonnes (MT) or Kilograms (Kg) per year

| | | | |
|-----|---|------------------|----------|
| 1. | Name & Address: Producer /Collection Centre/Dismantler/ Recycler/ Bulk consumer* | | |
| 2. | Date of issue of Authorization* Registration* | | |
| 3. | Validity of Authorization*/Registration* | | |
| 4. | Types & Quantity of e-waste handled/ generated | Category | Quantity |
| | | Item Description | |
| 5. | Types & Quantity of e-waste stored | Category | Quantity |
| | | Item Description | |
| 6. | Types & Quantity of e-waste sent to authorized collection centre/ registered dismantler or recycler | Category | Quantity |
| | | Item Description | |
| 7. | Types & Quantity of e-waste transported* | Category | Quantity |
| | | Quantity | |
| | Name, address and contact details of the destination | | |
| 8. | Types & Quantity of e-waste refurbished* | Category | Quantity |
| | | Item Description | |
| | Name, address and contact details of the destination of refurbished materials. | | |
| 9. | Types & Quantity of e-waste dismantled* | Category | Quantity |
| | | Item Description | |
| | Name, address and contact details of the destination | | |
| 10. | Types & Quantity of e-waste recycled* | Category | Quantity |
| | Types & Quantity of materials recovered | Item Description | |
| | | Quantity | |
| | Name, address and contact details of the destination | | |
| 11. | Types & Quantity of waste treated & disposed | Category | Quantity |
| | | Item Description | |

* Strike off whichever is not applicable

ANNEXURE-III

FORM – 3

[See rules 4(9), 5(4), 6(2), 7(7), 8(5) and 9(5)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted by producer/collection centre/dismantler/recycler by 30th June following to the financial year to which that return relates].

Quantity in Metric Tonnes (MT) or Kilograms (Kg) per year

| | | | |
|-------|---|------|----------|
| 1 | Name and address of the producer/collection centre/dismantler/ recycler | | |
| 2 | Name of the authorized person and complete address with telephone and fax numbers and e-mail address | | |
| 3 | Total quantity e-waste sold/purchased/sent for processing during the year for each category of electrical and electronic equipment listed in the Schedule 1 (Attach list) | | |
| | Details of the above | TYPE | QUANTITY |
| 3(A)* | DISMANTLERS: Quantity of e-waste in MT purchased & processed and sent to (category wise): | | |
| 3(B)* | RECYCLERS: Quantity of e-waste in MT purchased/processed (category wise): | | |
| 4 | Name and full address of the destination with respect to 3 (A-B) above | | |
| 5 | Type and quantity of materials segregated/ recovered from e-waste of different categories as applicable to 3(A) & 3(B) | Type | Quantity |

Note: The applicant shall provide details of funds received (if any) from producers and its utility with an audited certificate.

✓ enclose the list of recyclers to whom e-waste have been sent for recycling.

* strike off whichever is not applicable

Place _____

Date _____

Signature of the authorized person

ANNEXURE-IV

FORM – 4

[See rule 11(1)]

APPLICATION FORM FOR REGISTRATION OF FACILITIES POSSESSING ENVIRONMENTALLY SOUND MANAGEMENT PRACTICE FOR RECYCLING E-WASTE

(To be submitted in triplicate)

| | | | | |
|-----|--|--|--------------------------|----------|
| 1. | Name and Address of the unit | | | |
| 2. | Contact person with designation, Tel./Fax | | | |
| 3. | Date of Commissioning | | | |
| 4. | No. of workers (including contract labour) | | | |
| 5. | Consents Validity | a. Water (Prevention & Control of Pollution) Act, 1974; Valid up to _____ b. Air (Prevention & Control of Pollution) Act, 1981; Valid up to _____ | | |
| 6. | Authorization validity | E-wastes (Management and Handling) Rules, 2011; Valid up to _____ | | |
| 7. | Manufacturing Process | Please attach manufacturing process flow diagram for each product(s) | | |
| 8. | Products and Installed capacity of production in (MTA) | Products | Installed capacity (MTA) | |
| | | | | |
| | | | | |
| 9. | Products manufactured during the last three years (as applicable) | Year | Product | Quantity |
| | | | | |
| | | | | |
| 10. | Raw material consumption during the last three years (as applicable) | Year | Product | Quantity |
| | | | | |
| | | | | |
| 11. | Water consumption | Industrial _____ m ³ /day Domestic _____ m ³ /day | | |
| | Water Cess paid up to (if applicable) | | | |
| | Waste water generation as per consent _____ m ³ /day. | Actual (avg., of last 3 months) Industrial _____ m ³ /day Domestic _____ m ³ /day | | |
| | Waste water treatment (provide flow diagram of the treatment scheme) | Industrial _____ Domestic _____ | | |
| | Waste water discharge | Quantity _____ m ³ /day Location _____ | | |

| | | | | | |
|-----|---|---|--|----------|-----|
| | | Analysis of treated waste water for pH, BOD, COD, SS, O&G, any other parameter stipulated by SPCB/SPCC (attach details) | | | |
| 12. | Air Pollution Control | | | | |
| | a. Provide flow diagram for emission control system(s) installed for each process unit, utilities etc. | | | | |
| | b. Details for facilities provided for control of fugitive emission due to material handling, process, utilities etc. | | | | |
| | c. Fuel consumption | Fuel | Qty per day/month | | |
| | | (i) | | | |
| | | (ii) | | | |
| | d. Stack emission monitoring | Stack attached to | Emission (SPM, SO ₂ , NO _x , Pb etc.) mg/Nm ³ | | |
| | | (i) | | | |
| | | (ii) | | | |
| | e. Ambient air quality | Location Results ug/m ³ | Parameters SPM, SO ₂ , NO _x , Pb etc.) µg/m ³ | | |
| (i) | | | | | |
| | (ii) | | | | |
| 13. | Waste Management: | | | | |
| | a. Waste generation in processing e-waste | S No. | Type | Category | Qty |
| | | | | | |
| | | | | | |
| | b. Waste Collection and transportation (attach details) | | | | |
| | c. Provide details of disposal of residue. | S No. | Type | Category | Qty |
| | | | | | |
| | | | | | |
| | d. Name of Treatment Storage and Disposal Facility utilized for | | | | |
| | e. Please attach analysis report of characterization of hazardous waste generated (including leachate test if applicable) | | | | |
| 14. | Details of e-waste proposed to be procured through sale, contract or import, as the case may be, for use as | (i) | Name | | |
| | | (ii) | Quantity required/year | | |
| | | (iii) | Basel Convention Number | | |

| | | |
|-----|---|--|
| | raw material | |
| 15. | Occupational safety and health aspects | Please provide details of facilities |
| 16. | Remarks: | |
| | Whether industry has provided adequate pollution control system / equipment to meet the standards of emission / effluent. | Yes/No If Yes, please furnish details |
| | Whether industry is in compliance with conditions laid down in the Authorization | Yes / No |
| 17. | Any Other Information of relevance: i) ii) | |

I hereby declare that the above statements/information are true and correct to the best of my knowledge and belief.

Signature: _____

Date: _____

Name: _____

Place: _____

Designation: _____

ANNEXURE-V

FORM – 5

[See rule 15 (1)]

FORM FOR ANNUAL REPORT TO BE SUBMITTED BY THE STATE POLLUTION CONTROL BOARD/ COMMITTEES TO THE CENTRAL POLLUTION CONTROL BOARD

To.

The Chairman,
Central Pollution Control Board,
(Ministry of Environment and Forests),
Government of India,
'Parivesh Bhawan',
East Arjun Nagar,
Delhi – 110 0032.

| | | | |
|----|---|---|-------------------------------|
| 1. | Name of the State/Union territory | : | |
| 2. | Name & address of the State Pollution Control Board / Committee | : | |
| 3. | Number of authorised Producers, Collection Centres, registered Dismantler and Recyclers for management of e-waste in the State or Union territory under these rules | : | |
| 4. | Categories of waste collected along with their quantities on a monthly average basis | : | Please attach as Annexure-I |
| 5. | A Summary Statement on Category wise and product wise quantity of e-waste collected | : | Please attach as Annexure-II |
| 6. | Mode of treatment with details | : | Please attach as Annexure-III |
| 7. | Brief details of collection, dismantling and facilities | : | Please attach as Annexure-IV |
| 8. | Any other information | : | |
| 9. | Certified that the above report is for the period from | | |

Date : _____
Place: _____

Chairman or the Member Secretary
State Pollution Control Board/
Pollution Control Committee

[F.No.23-71/2009-HSMD]
RAJIV GAUBA, Jt. Secy

ANNEXURE-VI

Annexure I

Government Order No – FEE/9/ECO 2009, dated: 22-01-2009

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ನಡವಳಿಗಳು

ವಿಷಯ: ಹೊಸ ಯೋಜನೆಗಳಿಗೆ ಅನುದಾನ ಒದಗಿಸಿ ಮಾಡುವ ಬಗ್ಗೆ.

- ಓದಲಾಗಿದೆ: 1) ಸರ್ಕಾರಿ ಆದೇಶ ಸಂಖ್ಯೆ: ಅಪಕೇ 23 ಇಎಸ್‌ಕೆ 2007, ದಿನಾಂಕ: 20-12-2008.
 2) ಮತ್ತು ನಿರ್ದೇಶಕರು, ಎಂಕ್ರಿ ಇವರ ಪತ್ರ ಸಂಖ್ಯೆ: ಡಿಹ/ಟಹ/ಪ್ರಮೋಷನ್/ಡಿಇಇ/2009-651, ದಿನಾಂಕ: 7-1-2009.



ಪ್ರಸ್ತಾವನೆ:

ಮೇಲೆ ಕ್ರಮ ಸಂಖ್ಯೆ: 1 ರಲ್ಲಿ ಓದಲಾದ ಸರ್ಕಾರಿ ಆದೇಶದಲ್ಲಿ 2008-09ನೇ ಸಾಲಿನ ಅಯವ್ಯಯ ವೆಚ್ಚದ ಅಂದಾಜು ಪಟ್ಟಿಯಲ್ಲಿ ಅನುಮೋದಿಸಲಾಗಿರುವ ಹೊಸ ಯೋಜನೆಗಳನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಸರ್ಕಾರದ ಮಂಜೂರಾತಿ ನೀಡಲಾಗಿದೆ.

ಕ್ರಮ ಸಂಖ್ಯೆ: 2 ರಲ್ಲಿ ಓದಲಾಗಿರುವ ಎಂಕ್ರಿಯವರ ಪತ್ರ ದಿನಾಂಕ: 7-1-2009 ರಲ್ಲಿ ರೂ. 37.42 ಲಕ್ಷಗಳನ್ನು ಒದಗಿಸಿ ಮಾಡಲು ಪ್ರಸ್ತಾವನೆಯನ್ನು ಸಲ್ಲಿಸಿರುತ್ತಾರೆ. ಸರ್ಕಾರವು ಮತ್ತು ನಿರ್ದೇಶಕರು, ಎಂಕ್ರಿಯವರ ಪ್ರಸ್ತಾವನೆಯನ್ನು ಪರಿಶೀಲಿಸಿ ಈ ಕೆಳಕಂಡಂತೆ ಅದೇಶಿಸಿದೆ.

ಸರ್ಕಾರಿ ಆದೇಶ ಸಂಖ್ಯೆ: ಅಪಕೇ 9 ಇಎಸ್‌ಕೆ 2009, ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 22-01-2009

ಪ್ರಸ್ತಾವನೆಯಲ್ಲಿ ಒದಗಿಸಲಾಗಿರುವ ಅಂಶಗಳ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ಮತ್ತು ನಿರ್ದೇಶಕರು, ಎಂಕ್ರಿ ಇವರಿಗೆ ಕ್ರಮವಾಗಿ ಈ ಕೆಳಕಂಡಂತೆ ರೂ. 26.74 ಲಕ್ಷಗಳನ್ನು (ಇಪ್ಪತ್ತಾರು ಲಕ್ಷ ಎಪ್ಪತ್ತನಾಲ್ಕು ಸಾವಿರ ರೂಪಾಯಿಗಳು ಮಾತ್ರ) ಲೆಕ್ಕಕೋಡ್ 2435-60-000-0-09 ಉಪ ಕೋಡ್ 099 ಪರಿಶರ ಸ್ವೀಕೃತ ಮತ್ತು ಸಂರಕ್ಷಣೆ ಯೋಜನೆಯಡಿಯಲ್ಲಿ ಒದಗಿಸಿ ಮಾಡಿ ಅದೇಶಿಸಿದೆ.

| | | |
|-------|--|-----------------|
| 1 | Awareness creation & capacity Building | Rs. 5.58 Lakhs |
| 2 | Rural Environment Promotion programme | Rs. 5.58 Lakhs |
| 3 | Empowerment of Shri Shakthi | Rs. 5.58 Lakhs |
| 4 | ENVIS | Rs. 5.00 Lakhs |
| 5 | Market Survey of Reusable E-products | Rs. 5.00 Lakhs |
| Total | | Rs. 26.74 lakhs |

ಸರ್ಕಾರದಿಂದ ಒದಗಿಸಿ ಮಾಡಿರುವ ಅನುದಾನವನ್ನು ಬಳಸುವುದರಲ್ಲಿ ಪ್ರಾಮಾಣ್ಯತೆ ಇನ್ ಹಿಸ್ ಜವ್ಬುತ್ವ ತಯಾರಿಸಿ ಮೇಲು ಸೂಚಿಸಿ ಸರ್ಕಾರದ ಕಾರ್ಯದರ್ಶಿಗಳು, ಅರಣ್ಯ, ಪರಿಸರ ಮತ್ತು ಜೀವಶಾಸ್ತ್ರ ಇಲಾಖೆ ಇವರಿಗೆ ಸಲ್ಲಿಸಿ, ಸದರಿ ಅನುದಾನವನ್ನು ಪಡೆಯಲು ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ, ಅರಣ್ಯ, ಪರಿಸರ ಮತ್ತು ಜೀವಶಾಸ್ತ್ರ ಇಲಾಖೆ ಇವರಿಂದ ಮೇಲು ಸೂಚಿಸಿ ಪಡೆಯತಕ್ಕದ್ದು.

Handwritten signature and date: 18/2

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- 2 -

ಸದರಿ ಅನುದಾನವನ್ನು ಉದ್ದೇಶಿತ ಕಾರ್ಯಕ್ಕೆ ಉಪಯೋಗಿಸಿರುವ ಬಗ್ಗೆ ಸರ್ಕಾರಕ್ಕೆ ವರದಿ ಮಂಡನೆಗೈದ್ದು ಹಾಗೂ ಅನುದಾನ ಸ್ವೀಕೃತರು ಕರ್ನಾಟಕ ಅರ್ಥಿಕ ಸಂಹಿತೆ 1958 ರ ಸಹಾಯಕ ಅನುದಾನಗಳಡಿಯ ನಿಯಮ 161 ರನ್ವಯ ಷರತ್ತು ಮತ್ತು ನಿಬಂಧನೆಗಳಿಗೆ ಒಳಪಟ್ಟಿರುತ್ತಾರೆ

ಈ ಅದೇಶವನ್ನು ಅರ್ಥಿಕ ಇಲಾಖೆಯ ಆದೇಶ ಸಂಖ್ಯೆ: ಎಫ್.ಡಿ 1 ಒಎಫ್.ಕೆ 96, ದಿನಾಂಕ: 10-07-1996 ರಲ್ಲಿ ಇಲಾಖಾ ಕಾರ್ಯದರ್ಶಿಯವರಿಗೆ ನೀಡಿರುವ ಅಧಿಕಾರದ ಪ್ರತ್ಯಾಯೋಜನೆಯ ಅನ್ವಯ ಹೊರಡಿಸಲಾಗಿದೆ.

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆದೇಶಾನುಸಾರ
ಮತ್ತು ಅವರ ಹೆಸರಿನಲ್ಲಿ

(ಎನ್.ಆರ್. ಹಗಣ್ಣಾಚಾರ್ಯ)

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ,

ಅರಣ್ಯ, ಪರಿಸರ ಮತ್ತು ಐವಿಶಾಸ್ತ್ರ ಇಲಾಖೆ.

ಇವರಿಗೆ:

- 1) ಮಹಾಲೇಖಪಾಲರು, (ಲೆಕ್ಕಪತ್ರ/ಲೆಕ್ಕ ಪರಿಶೋಧನೆ) ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
- 2) ಸರ್ಕಾರದ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 3) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 4) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು ಹಾಗೂ ಅಜವೃದ್ಧಿ ಆಯುಕ್ತರು, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 5) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು ಹಾಗೂ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು, ಅರ್ಥಿಕ ಇಲಾಖೆ, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 6) ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ, ಅರ್ಥಿಕ, ಅರಣ್ಯ, ಯೋಜನಾ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.
- 7) ಸರ್ಕಾರದ ಆಂತರಿಕ ಅರ್ಥಿಕ ಸಲಹೆಗಾರರು ಹಾಗೂ ಬದನಿಮಿತ್ರ ಕುಪಕಾರ್ಯದರ್ಶಿಗಳು, ಅಪಹೇ ಇಲಾಖೆ.
- 8) ನಿರ್ದೇಶಕರು, ಪರಿಯೋಜನಾರಹಿತ ವಿದ್ಯಾ, ಯೋಜನಾ ಇಲಾಖೆ, ಐಪಿಒಕೆಡಿ ಕಟ್ಟಡ, ಬೆಂಗಳೂರು.
- 9) ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ, ಅರ್ಥಿಕ ಇಲಾಖೆ ವೆಸ್ಟ್-ಫ್ರೆಂಚ್/ಉ.ಕಾ. ಅರ್ಥಿಕ ಇಲಾಖೆ ಐ.ಐ.ಆರ್, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 10) ನಿರ್ದೇಶಕರು, ಯೋಜನಾ ಇಲಾಖೆ, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
- 11) ನಿರ್ದೇಶಕರು, ಖಜಾನೆ ನಿರ್ದೇಶಕರುಗಳು, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
- 12) ಹಂಪಿ ನಿರ್ದೇಶಕರು, ರಾಜ್ಯ ಪುಸ್ತಕಾಲಯ, ಖಜಾನೆ, ನೈಪಾಯಂಗ ರಸ್ತೆ, ಬೆಂಗಳೂರು.
- 13) ಬಹಾನಾಧಿಕಾರಿ, ಹಿಲ್ವಾ ಖಜಾನೆ, ಬೆಂಗಳೂರು ನಗರ ಜಿಲ್ಲೆ, ಬೆಂಗಳೂರು.
- 14) ಮಹಾನಿರ್ದೇಶಕರು, ಎಂ.ಪಿ. ಹನಿರು ಭವನ, ದೊರೆನಗುಡಿ ಪಾಲ್ಕೆ ಭಾರತ್ ಸ್ಟ್ರೀಟ್, ಕ್ಯಾಂಪಸ್, ವಿನಾಯಕ ನಗರ ಸರ್ಕಲ್, ಹೆ.ಕೆ. ನಗರ, 5ನೇ ಹಂತ, ಬೆಂಗಳೂರು-76.
- 15) ಹಿರಿಯ ನಿರ್ದೇಶಕರು, ತಾಂತ್ರಿಕ ಗ್ರಂಥಾಲಯ, ಅಪಹೇ ಇಲಾಖೆ ರವರ ಆಪ್ತ ಸಹಾಯಕರು,
- 16) ಸರ್ಕಾರದ ಕಾರ್ಯದರ್ಶಿಗಳು, ಅರಣ್ಯ ಪರಿಸರ ಮತ್ತು ಐವಿಶಾಸ್ತ್ರ ಇಲಾಖೆ, (ಅರಣ್ಯ/ಪರಿಸರ) ರವರ ಆಪ್ತ ಸಹಾಯಕರು.
- 17) ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ, ಪರಿಸರ ಅಪಹೇ ರವರ ಆಪ್ತ ಸಹಾಯಕರು,
- 18) ಸಂಬಂಧಿಸಿದ ವ್ಯಕ್ತಿಗಳಾದವರಿಗಳು, ಹಾಗೂ ಪರಿಸರ ಎ ಮತ್ತು ಐ ಡಿ ಡಿ, ಅಪಹೇ ಇಲಾಖೆ.
- 19) ರಕ್ಷಾಪಡೆ
- 20) ಜಿ.ಪಿ.ಪಿ.ಗಳು.

ANNEXURE-VII



**Annexure VII
Environmental Management and Policy Research Institute
(An autonomous institute of Department of Forest, Ecology and
Environment, Government of Karnataka)**



Data collection format for IT companies

Company Name:

Contact person name:

Address:

1. Numbers of laptops/computers annually purchased?

2. Total number of computers/laptops used in your company?

3. Number of laptops/ computers annually discarded?

4. What is the procedure followed for reusing or recycling of the discarded e-products?

5. What is the average life span of computer/laptop (in your company)?

6. Does the manufacturer take back its obsolete products? If yes, what is the procedure?

7. What do you do with e-waste?

8. Are you giving e-waste to any refurbishing shops? If yes who are the vendors?

9. Do you donate e-products for reuse to any government institutions or others? If yes then whom?

Comments of the interviewer

Date:

Name of the interviewer:

Place:

Designation:

Organization:

ANNEXURE-VIII



Annexure VIII
Environmental Management and Policy Research Institute
 (An autonomous institute of Department of Forest, Ecology and
 Environment, Government of Karnataka)



Data collection format for showrooms dealing with electrical and electronic products

| Particulars | Information |
|-------------------------|-------------|
| Year of establishment | |
| Showroom name | |
| Address | |
| Contact person | |
| Licence number and date | |

| Kind | Source of procurement | Numbers procured per month | Number damaged and returned to the source per month (out of col.3) | Number of products refurbished/ repaired (out of col.3) | Number of refurbished products sold (out of col.5) |
|------------------|-----------------------|----------------------------|--|---|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Computers | | | | | |
| Laptops | | | | | |
| TVs | | | | | |
| Mobile Phones | | | | | |
| Refrigerators | | | | | |
| Washing machines | | | | | |
| Hand mixes | | | | | |
| Microwaves | | | | | |
| ACs | | | | | |

| | | | | | | | | | |
|--|-----------|---------|-----|---------------|--------------|------------------|-----|------------|-----------|
| | | | | | | | | | |
| Do you have any exchange or take back programs? If yes then on what brands/products? | | | | | | | | | |
| Mode of disposal of the non-repairable products | | | | | | | | | |
| What is the sale per month/year of the products? | | | | | | | | | |
| What is the lifespan of the products? | computers | laptops | TVs | Refrigerators | mobile phone | washing machines | ACs | microwaves | handmixes |
| | | | | | | | | | |
| What is warranty period for the products? | | | | | | | | | |

Comments of the interviewer

Date:

Name of the interviewer:

Place:

Designation:

Organization:

ANNEXURE-IX



Annexure IX
Environmental Management and Policy Research Institute
 (An autonomous institute of Department of Forest, Ecology and
 Environment, Government of Karnataka)



A data collection format for shops which sell/repair/refurbish electrical and electronic products

| Particulars | Information |
|-------------------------|-------------|
| Year of establishment | |
| Shop name | |
| Address | |
| Contact person | |
| Licence number and date | |

| Kind | Source | Monthly receipt (Nos.) | Parts repaired/refurbished | Numbers refurbished per month (out of col.3) | Number of refurbished products sold per month (out of col. 5) | Number of Non-refurbished products per Month (out of col.3) |
|------------------|--------|------------------------|----------------------------|--|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Computers | | | | | | |
| Laptops | | | | | | |
| TVs | | | | | | |
| Mobile Phones | | | | | | |
| Refrigerators | | | | | | |
| Washing machines | | | | | | |
| Hand mixes | | | | | | |
| Microwaves | | | | | | |
| ACs | | | | | | |

| | | | | | | | | | |
|--|-----------|---------|-----|---------------|--------------|------------------|-----|------------|-----------|
| Cooling items(deep freezers etc) | | | | | | | | | |
| Mode of disposal of non-refurbished products | | | | | | | | | |
| Total quantity of waste obtained (in nos.) and what do you do with these wastes? | | | | | | | | | |
| Market potential for refurbished product per month/year (in Rupees) | | | | | | | | | |
| What is the lifespan of the products? | computers | laptops | TVs | Refrigerators | mobile phone | washing machines | ACs | microwaves | handmixes |
| | | | | | | | | | |
| What is warranty period for the products? | | | | | | | | | |

Comments of the interviewer

Date:

Name of the interviewer:

Place:

Designation:

Organization:

ANNEXURE-X



Annexure X
Environmental Management and Policy Research Institute
(An autonomous institute of Department of Forest, Ecology and
Environment, Government of Karnataka)



Data collection format for Authorized Recyclers

Date of Research Conducted: _____

Staff accompanied: _____

Authorized in: _____

License Number: From _____ to _____

| 1. | Name of the industry | | | | | | |
|-------------------------|--|--|-------------------------|-------------------------|----------------|-----------|--|
| 2. | Location: - Head Office - Recycling Unit | | | | | | |
| 3. | Date of Establishment | | | | | | |
| 4. | Sources From Where the E-waste Is Obtained | - IT Sector - Commercial - Private - Government - Public - Others | | | | | |
| 5. | What are the different kinds of e-waste obtained? | | | | | | |
| 6. | What is the quantity of e-waste collected? | | | | | | |
| 7. | Methodologies being followed to separate/segregate/dismantle/recycle. | | | | | | |
| 8. | What is the quantity of dismantled products? | | | | | | |
| 9. | Time span for collecting the e-waste | | | | | | |
| 10. | Do you accept CRTs and other lead containing glass materials? If so, what do you do with these materials? | Y/N Reason: | | | | | |
| 11. | Are CFL bulbs collected and disposed if so? | Y/N | | | | | |
| 12. | Are there any methods being used to dispose of the waste using land fill? | | | | | | |
| 13. | What products and volumes do you send to the incinerator? | | | | | | |
| 14. | Where are the wastes being stored? | | | | | | |
| 15. | What are the components obtained after recycling? | Actual percentage recovery of these metals | | | | | |
| | <table border="1"> <thead> <tr> <th>Metals/other components</th> <th>Quantity in kgs/others.</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>Aluminium</td> <td></td> <td></td> </tr> </tbody> </table> | | Metals/other components | Quantity in kgs/others. | Percentage (%) | Aluminium | |
| Metals/other components | Quantity in kgs/others. | Percentage (%) | | | | | |
| Aluminium | | | | | | | |

| | | | | |
|-----|--|--|--|--|
| | Copper | | | |
| | Gold | | | |
| | Silver | | | |
| | Palladium | | | |
| | Glass | | | |
| | Plastics | | | |
| | Mild steel | | | |
| | Others | | | |
| 16. | What do you do with the recycled products? | | | |
| 17. | Final recycled products quantity | | | |
| 18. | Recovery of precious metals with process details | | | |
| 19. | How are hazardous wastes being managed? | | | |
| 20. | What is the quantity of hazardous waste generated? | | | |
| 21. | What are the flows of these products (recycled components) into the market? | | | |
| 22. | Quantity of re-usable e- products collected (computes, desktops, laptops, cell phones etc) coming to your recycling unit. | | | |
| 23. | If the e-products have minor defects where do they get repaired? Do you do any refurbishment/resale of these e-products that you collect? | | | |
| 24. | What is their market? Where do you sell off? | | | |
| 25. | How do you dispose the remaining waste? | | | |
| 26. | Are all the materials being handled as per the rules that have been laid down by KSPCB? | | | |
| 27. | How many labours are trained under your unit and how often you schedule training to them? | | | |
| 28. | Are there draw backs of recycling at your unit? | | | |
| 29. | Why do you think it is important to recycle the e-waste? | | | |
| 30. | Do you collect waste from the informal sectors? If yes in what quantity do you collect? | | | |
| 31. | If yes, then their contacts established and in the process how many? | | | |
| 32. | Do you collect wastes from shops which repair/refurbish electrical and electronic products? If yes, then their contacts established and in the process how many? | | | |
| 33. | Who are the vendors for your recycled components? | | | |

| | | |
|-----|--|--|
| | (contacts established and in process) | |
| 34. | What made you to take this profession? | |
| 35. | Do you think your situation has improved after shifting from an unauthorized recycler to an authorized? | |
| 36. | Financially while setting up your unit did you have any financial help or did you have to manage everything on your own? | |
| 37. | What are the problems being faced? | |
| 38. | Any further recommendations? | |
| 39. | Has Government supported you by any subsidies after establishing the recycling unit? | |

| |
|---|
| <p><u>Comments of the interviewer</u></p> |
|---|

Date:

Name of the interviewer:

Place:

Designation:

Organization:

ANNEXURE-XI



Annexure XI
Environmental Management and Policy Research Institute
(An autonomous institute of Department of Forest, Ecology and
Environment, Government of Karnataka)



Data collection format for Unauthorized Recyclers

Area name:

Contact person name:

Address:

1. From where do you take the scrap?

2. What are kinds of products you collect in scrap?

3. How many in quantity (kgs)/numbers you collect? And what is the rate per kg of collection?

4. Are they all comes as obsolete? [If any which are the ones that can be repaired and resold (provide quantity in numbers)]?

5. How do you do the recycling of these products? What are the methods?

6. What are the metals and the other components being extracted?

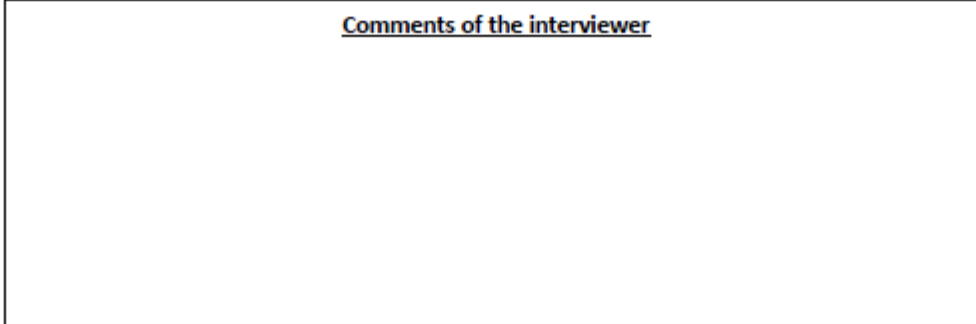
| Metals/other components | Quantity of the metals in kgs /others. | Percentage (%) recovery of these metals by them | Actual percentage recovery of these metals |
|-------------------------|--|---|--|
| Aluminium | | | |
| Copper | | | |
| Gold | | | |
| Silver | | | |
| Palladium | | | |
| Glass | | | |
| Plastics | | | |
| Mild steel | | | |
| Others | | | |

7. What do you do with the left over wastes after extraction of metals/plastic and others?

8. What do you do after extraction of the above components? If you sell then what is the rate per kg? And where do you sell them?

9. Would you like to become an authorized recycler? If no, why?

Comments of the interviewer



Date:

Name of the interviewer:

Place:

Designation:

Organization:

ANNEXURE-XII

ಫ್ಯಾಕ್ಸ್ / Fax : 080-25586321
 ಈಮೇಲ್ / E-mail : ho@kspcb.gov.in
 ವೆಬ್‌ಸೈಟ್ / Website : http://kspcb.gov.in



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 25588151, 25588
 25588142, 25586

**ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
 Karnataka State Pollution Control Board**

“ಪರಿಸರಭವನ”, 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ.49, ಚರ್ಚ್‌ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ, ಭಾರತ
 "Parisara Bhavana", 1st to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, INDIA

No. PCB/1902/E-Waste/SMC/Bulkconsumer/Circular/2012-13 **5213** Date: **08 JAN 20**

CIRCULAR

Sub.: Applicability of E-Waste (Management and Handling) Rules, 2011 to Bulk Consumers - Reg.

Ref.: Ministry of Environment and Forests Notification no. S. O. 1125 (E), Dated: 14 May 2010.

The Government of India, Ministry of Environment and Forests has framed “E-Waste (Management and Handling) Rules, 2011”. These rules shall apply to every Producer, Consumer/Bulk Consumer involved in the manufacture/sale/purchase and processing of Electrical and Electronic Equipments or components as specified in Schedule-I, Collection Centre, Dismantler and Recycler of E-Waste.

The notification also defines the Bulk consumer and its responsibilities.

Rule 3(c) ‘bulk consumer’ means bulk users of Electrical and Electronic Equipment such as Central Government or State Government Departments, Public Sector undertakings, Banks, Educational Institutions, Multinational Organizations, International Agencies and Private Companies that are registered under the Factories Act, 1948 and Companies Act, 1956;

Rule 6, Responsibilities of Consumer or Bulk Consumer;

- (1) Consumers or Bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that E-Waste generated by them is **channelized to authorized collection centre(s) or registered dismantler(s) or recycler(s)** or is returned to the pick-up or take back services provided by the producers; and
- (2) Bulk consumers shall maintain records of E-Waste generated by them in Form-2 and make such records available for scrutiny by the State Pollution Control or the Pollution Control Committee concerned.

“ಪ್ಲಾಸ್ಟಿಕ್ ಬಳಕೆ ನಿಲ್ಲಿಸಿ, ಪರಿಸರ ಹಾನಿ ತಪ್ಪಿಸಿ”

AVOID USE OF PLASTICS- BE 'ECO' FRIENDLY

Therefore, all the Government/Private Departments as defined in the Bulk Consumer needs to maintain only Form-2 and make such records available for scrutiny by the State Pollution Control or the Pollution Control Committee concerned when they visit/inspect the unit.

It is also clarified that, Authorization is not prescribed or to obtain from Karnataka State Pollution Control Board for Bulk Consumers.

Draft Approved by
Member Secretary

Sd/-

MEMBER SECRETARY

To,

All Regional Officers

Copy to :

- ✓ 1. All Regional Senior Environmental Officers.
- ✓ 2. Corporate Cell for information.
- ✓ 3. Help Desk
- ✓ 4. Website publication.
- ✓ 5. Case file.

o/c


SENIOR ENVIRONMENTAL OFFICER

6/1/14.

ANNEXURE-XIII

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ: ಸಿಆಸುಇ 46 ಇಆಇ 2013

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ,

ಬಹುಮಹಡಿ ಕಟ್ಟಡ

ಬೆಂಗಳೂರು-1 ದಿನಾಂಕ 6ನೇ ಅಗಸ್ಟ್ 2013

ಸುತ್ತೋಲೆ

ವಿಷಯ: ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳ ಜೀವತಾವಧಿಯನ್ನು ನಿರ್ಧರಿಸುವ ಬಗ್ಗೆ.
 ಉಲ್ಲೇಖ: ದಿನಾಂಕ 08.01.2013 ರಂದು ನಡೆದ ರಾಜ್ಯ ಮಟ್ಟದ ತಾಂತ್ರಿಕ ಸಲಹಾ ಸಮಿತಿ ಸಭೆಯ ನಡವಳಿಗಳು.

1. ಹಲವಾರು ಇಲಾಖೆಗಳು ತಮ್ಮಲ್ಲಿರುವ ಹಳೆಯ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳ ಜೀವತಾವಧಿ ಮತ್ತು ವಿಲೇವಾರಿ ಮಾಡುವ ಬಗ್ಗೆ ಸರ್ಕಾರದ ಅಭಿಪ್ರಾಯ/ ಆದೇಶವನ್ನು ನೀಡುವಂತೆ ಕೋರುತ್ತಿವೆ. ಇತರೆ ಅಂಶಗಳೊಂದಿಗೆ, ಹಳೆಯ ಗಣಕಯಂತ್ರ ಮತ್ತು ಇತರೆ ಪರಿಕರಗಳ ವಿಲೇವಾರಿ ಬಗ್ಗೆ, ಈ ಹಿಂದೆ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಮತ್ತು ಜೈವಿಕ ತಂತ್ರಜ್ಞಾನ ನಿರ್ದೇಶನಾಲಯದ (ಹಿಂದಿನ ಕರ್ನಾಟಕ ಸರ್ಕಾರಿ ಗಣಕ ಕೇಂದ್ರ) ವತಿಯಿಂದ ದಿನಾಂಕ 18.06.1998ರ ಸುತ್ತೋಲೆ ಸಂಖ್ಯೆ ಜಿಸಿಸಿ/ಅಎಎ/385/97-98ರನ್ವಯ ಕೆಲವು ಮಾರ್ಗಸೂಚಿಗಳನ್ನು ನೀಡಲಾಗಿತ್ತು. ನಂತರ, ಈ ಕುರಿತಂತೆ ಸರ್ಕಾರದ ದಿನಾಂಕ 11.01.2010ರ ಸುತ್ತೋಲೆ ಸಂಖ್ಯೆ ಸಿಆಸುಇ 02 ವಿಮಾಆ 2010ರ ಮೂಲಕ ಕೆಲವು ಸೂಚನೆಗಳನ್ನು ನೀಡಲಾಗಿತ್ತು.
2. ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳ ಜೀವತಾವಧಿಯನ್ನು ನಿರ್ಧರಿಸುವ ಬಗ್ಗೆ ಇತ್ತೀಚೆಗೆ ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ದಿನಾಂಕ 08.01.2013ರಂದು ನಡೆದ ರಾಜ್ಯ ಮಟ್ಟದ ತಾಂತ್ರಿಕ ಸಲಹಾ ಸಮಿತಿಯ ಸಭೆಯಲ್ಲಿ ವಿವರವಾಗಿ ಚರ್ಚಿಸಿ, ಹಳೆಯ ನಿರುಪಯುಕ್ತ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರೆ ಗಣಕ ಪರಿಕರಗಳ ಜೀವತಾವಧಿ ನಿರ್ಧರಿಸಲು ಹಾಗೂ ವಿಲೇವಾರಿ ಮಾಡಲು ಕೆಳಕಂಡ ಮಾನದಂಡವನ್ನು ಅನುಸರಿಸಬಹುದೆಂದು ನಿರ್ಣಯಿಸಲಾಯಿತು :-

- (ಅ) ಗಣಕ ಕ್ಷೇತ್ರದಲ್ಲಿ ತಾಂತ್ರಿಕತೆ ತೀವ್ರವಾಗಿ ಬದಲಾವಣೆಯಾಗುತ್ತಿರುವುದನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು, 20% ಸವಕಳಿಯೆಂದು ಪರಿಗಣಿಸಿ, ಗಣಕಯಂತ್ರ, ಯು.ಪಿ.ಎಸ್. ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳ ಜೀವತಾವಧಿಯನ್ನು ಕನಿಷ್ಠ 5 ವರ್ಷಗಳೆಂದು ಪರಿಗಣಿಸುವುದು.
- (ಆ) ಇಲಾಖೆಗಳು ಗಣಕಯಂತ್ರ, ಯು.ಪಿ.ಎಸ್. ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳನ್ನು ಖರೀದಿಸಿ ಅಳವಡಿಸಿದ 5 ವರ್ಷಗಳ ನಂತರ, ರಿಪೇರಿ ಮಾಡಲು ಸಾಧ್ಯವಾಗದೇ ಇರುವ/ಹಾಳಾಗಿರುವ ಗಣಕಯಂತ್ರ ಮತ್ತು ಇತರೆ ಪರಿಕರಗಳನ್ನು ನಿರುಪಯುಕ್ತ ವಸ್ತುಗಳೆಂದು ನಿರ್ಣಯಿಸಬಹುದು.
- (ಇ) ದಿನಾಂಕ 7.1.2005ರ ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ ಸಿಆಸುಇ 39 ಇಜಿವಿ 2004 ಮತ್ತು ದಿನಾಂಕ 15.2.2010ರ ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ ಸಿಆಸುಇ 147 ಇಆಇ 2009ರನ್ವಯ ನಿಗದಿಪಡಿಸಿದ ಕಾರ್ಯವಿಧಾನದಂತೆ, ಆಯಾ ಇಲಾಖೆಗಳು ಅವುಗಳ ಇ-ಆಡಳಿತ ವಾರ್ಷಿಕ ಕ್ರಿಯಾ ಯೋಜನೆಗಳ ಅನುಮೋದನೆ ಪಡೆಯುವ ಸಂದರ್ಭದಲ್ಲಿ, ವಿಲೇ ಮಾಡಬಹುದಾದ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳ ವಿವರಗಳನ್ನು ನೀಡಿ, ಇ-ಆಡಳಿತ ವಾರ್ಷಿಕ ಕ್ರಿಯಾ ಯೋಜನೆಗಳ ಅನುಮೋದನಾ

ಸಮಿತಿಯ ಹಾಗೂ ಆಯಾ ಆಡಳಿತ ಇಲಾಖೆಯ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ/ಕಾರ್ಯದರ್ಶಿಯವರ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ರಚಿತವಾಗಿರುವ ತಾಂತ್ರಿಕಾ ಸಲಹಾ ಸಮಿತಿಯ ಅನುಮೋದನೆ ಪಡೆಯತಕ್ಕದ್ದು.

(ಈ) ನಿರುಪಯುಕ್ತ ವಸ್ತುಗಳೆಂದು ನಿರ್ಣಯಿಸಿದ ಗಣಕಯಂತ್ರ, ಯು.ಪಿ.ಎಸ್, ಹಾಗೂ ಇತರೆ ಪರಿಕರಗಳನ್ನು

(1) Buy-back ಅಥವಾ

(2) ಇ-ವೆಸ್ಟ್ ನ್ನು ವಿಲೇವಾರಿ ಮಾಡಲು ಭಾರತ ಸರ್ಕಾರ ನೀಡಿರುವ ಮಾರ್ಗಸೂಚಿಗಳಂತೆ, ಸಾರ್ವಜನಿಕ ಹರಾಜು ಮೂಲಕ ವಿಲೇವಾರಿ ಮಾಡುವುದು.

3. ಸರ್ಕಾರದ ಇಲಾಖೆಗಳು ಹಳೆಯ ನಿರುಪಯುಕ್ತ ಗಣಕಯಂತ್ರ ಮತ್ತು ಇತರೆ ಗಣಕ ಪರಿಕರಗಳ ಜೀವತಾವಧಿ ನಿರ್ಧಾರಿಸಲು ಹಾಗೂ ಅವುಗಳ ವಿಲೇವಾರಿ ಮಾಡಲು ಮೇಲಿನ ಕಂಡಿಕೆ 2ರಲ್ಲಿ ನಮೂದಿಸಿದ ಮಾರ್ಗಸೂಚಿಗಳನ್ನು ಪಾಲಿಸಬಹುದೆಂದು ಈ ಮೂಲಕ ತಿಳಿಸಿದೆ.
4. ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ/ಕಾರ್ಯದರ್ಶಿಯವರು ಈ ಸುತ್ತೋಲೆಯನ್ನು ಅವರ ವ್ಯಾಪ್ತಿಗೆ ಬರುವ ಇಲಾಖೆಗಳ ಗಮನಕ್ಕೆ ತರಲು ಕೋರಿದೆ.
5. ದಿನಾಂಕ 20.7.2013ರ ಟಿಪ್ಪಣಿ ಸಂಖ್ಯೆ:ಆಇ 548 ವೆಬ್ಬೆ-12/2013ರನ್ವಯ ಆರ್ಥಿಕ ಇಲಾಖೆ ನೀಡಿದ ಸಹಮತಿಯಂತೆ ಈ ಸುತ್ತೋಲೆಯನ್ನು ಹೊರಡಿಸಿದೆ.



(ಬಿ.ಎಸ್.ಎನ್.ಪ್ರಸಾದ್)

ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ,

ನಿಬ್ಬಂದಿ ಮತ್ತು ಆಡಳಿತ ಸುಧಾರಣೆ ಇಲಾಖೆ(ಇ-ಆಡಳಿತ)

ಗೆ:

ಸಂಕಲನಕಾರರು, ಕರ್ನಾಟಕ ರಾಜ್ಯಪತ್ರ, ಇವರು ಈ ಸುತ್ತೋಲೆಯನ್ನು ಮುಂದಿನ ರಾಜ್ಯ ಪತ್ರದಲ್ಲಿ ಪ್ರಕಟಿಸಿ, ಅದರು 500 ಪ್ರತಿಗಳನ್ನು ವೀರಾಧಿಕಾರಿ-1, ಸಿಆಸುಇ (ಇ-ಆಡಳಿತ), ಇವರಿಗೆ ಕಳುಹಿಸಲು ಕೋರಿದೆ.

ಪ್ರತಿ:

1. ಸರ್ಕಾರದ ಎಲ್ಲಾ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳವರು.
2. ಸರ್ಕಾರದ ಎಲ್ಲಾ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ ಮತ್ತು ಕಾರ್ಯದರ್ಶಿಗಳವರು.
3. ಮಹಾಲೇಖಪಾಲಕರು, ಲೆಕ್ಕಪತ್ರ 1 ಮತ್ತು 2, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
4. ಎಲ್ಲಾ ಇಲಾಖಾ ಮುಖ್ಯಸ್ಥರು.
5. ಶಾಖಾ ರಕ್ಷ ಕಡತ /ಬಿಡಿಪ್ರತಿಗಳು.

ANNEXURE-XIII(Translated version)

Government of Karnataka

DPAR 46 EGE 2013

Government of Karnataka Secretariat
Multiplex Building
Bangalore-1 Date 6th August 2013

Circular (Translated version)

Sub: Fixation of the period of longevity for computer and other accessories- reg.

Ref: Proceedings of the State Level Technical Advisory Committee dated 08.01.2013

1. Many departments are asking the opinion / orders of the Government to fix the period of longevity to dispose-off their computers and other accessories. For the disposal of computer and other accessories letter from Information Technology & Biotechnology directorate (former named as Karnataka Govt. Computer Centre) had issued guidelines through its circular No. GCC/TAP/385/97-98 dated 18.06.1998. In this regard, Government of Karnataka had issued instructions through a circular dated 11.01.2010 vide no. DPAR 02 VMA 2010.
2. To decide the period of longevity of computer and other accessories, the State Level Technical Advisory Committee under the chairmanship of Additional Chief Secretary of the Government discussed this subject in detail and decided the following guidelines for the fixation of the period of longevity and disposal of old and unserviceable computer and other computer accessories.
 - a) In view of the rapid change in the technology in the field of computers, by keeping 20% depreciation a minimum of 5 years is to be considered as the period of longevity for computer and accessories.
 - b) After a period of 5 years from the date of procurement of the computers, Ups and other accessories, the un-repairable and unserviceable computers and other accessories can be declared as obsolete/ useless.
 - c) As per the procedure fixed vide Govt. Orders DPAR39EGV2204 Dt. 07.01.2005 and DPAR 147 EGA 2009 dated 15.02.2010 respective departments whenever they desire to take the approval for their E-Governance Annual ACTION Plan, they should provide the details of the computers and other accessories to be disposed off and should take the approval of E-Governance Annual Action Plan Approval Committee and the Technical Advisory Committee formed under the chairmanship of Principal Secretaries/ Secretaries of the respective Departments.
 - d) The Buy -back or the disposal of computers and its accessories which are declared as obsolete should be done through public auction as per the guidelines of Government of India.

3. The Departments of Government of Karnataka hereby instructed to follow the guidelines as per Para (2) above for fixing of the period for longevity to dispose of the computers and accessories.
4. The Principal Secretaries and Secretaries are hereby requested to bring this circular to the notice of their respective departments.
5. This circular issued in concurrence with the note No. AE 548 – Exp. 12/2013 of Finance Dept. Dt. 20.07.2013.

Sd/-
ISN Prasad
Principal Secretary
DPAR(E-Governance)
Government of Karnataka

Copy to:

1. All Government Chief Secretaries
2. All Government Secretaries
3. Karnataka Chief Audit Generals, Audit letter 1 and 2 , Bangalore, Karnataka
4. All Departments Chairman's

ANNEXURE-XIV

Phone: 080-25586321
E-mail: ho@kspcb.gov.in
Website: http://kspcb.gov.in



25581383, 25589112
25588151, 25588270
25588142, 25586520

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
Karnataka State Pollution Control Board

"ಪಾರಿಸಾರ ಭವನ", 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ.49, ಚರ್ಚ್‌ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ, ಭಾರತ
"Pansara Bhavana", 1st to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, INDIA

No.PCB/131/E-Waste/2014/786

Date: 30/03/2014

To,
Secretary to Government,
(e-governance)
Department of Personal Administrative Reforms,
6th Floor, 1st Gate, M. S. Building,
Bangalore-560001

Sir,

Sub: Compliance to E-Waste (Management and Handling) Rules, 2011 - Reg.

Government of India has framed E-Waste (Management and Handling) Rules, 2011 under which all E-Waste generators shall maintain records and dispose E-Waste in accordance with rules. Non compliance to rules will attract penal provision of Environment (Protection) Act, 1986.

All Government Departments shall therefore follow the procedure for e-auctioning of all E-Wastes produced/stocked at your office/organizations.

You may refer to MSTC Limited website www.msteindia.co.in for all information and procedures.

Also, you may refer KSPCB website www.kspcb.gov.in to access the list of operators/recyclers/re-processors of E-Waste authorized by KSPCB.

Yours faithfully

MEMBER SECRETARY

COPIES NO. 16614
Date: 30/3/14

CE-1
3/11

1-2-2014
2/2
11/2/14
8/3/14

ANNEXURE-XV

| DETAILS OF KSPCB AUTHORIZED & REGISTERED E-WASTE DISMANTLERS & RECYCLERS | | | | | | | |
|---|---|-------------------------------|---------------------|---------------------|---------------------------------|------------------------------|--|
| Sl. No. | Name & Address of unit | Authorized Qty. (MT/A) | Activity | Working /YTC | Authorization Valid upto | Registration Validity | Contact No & E-mail Id |
| 1 | M/s. Ash Recyclers, No.3, KSSIDC (i) Estate, Hoskote, Bangalore-14. | 120 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2016 | 9844064636 |
| 2 | M/s. E-Parisara Pvt Ltd, No 30-P3 Dabaspet Bangalore. | 8820 | E-waste recycling | Working | 30.06.2015 | Upto 30/08/2015 | 080-28360902, recycle@ewaste.com |
| 3 | M/s. Sriram Eco Raksha Computer Services Pvt Ltd., No. B-29, KSSIDC Indl. Estate, Bommasandra, Hosur Road, Anekal Taluk, Bangalore - 560 099. | 500 | E-waste Dismantling | Working | 30.06.2014 | upto 30/06/2015 | 080-27836755, blr@newportcomputers.com |
| 4 | M/s. New Port Computer Services (India) Pvt. Ltd. No. B-29, KSSIDC Indl. Estate, Bommasandra, Hosur Road, Anekal Taluk, Bangalore - 560 099. | 500 | E-waste recycling | Working | 30.06.2014 | upto 30/06/2015 | 080-27836755, blr@newportcomputers.com |
| 5 | M/s. E-Wardd & Co., No.6/1B, 14 th Cross, Hosur Road, Bommanahalli, Bangalore - 560 068. | 600 | E-waste recycling | Working | 30.06.2013 | upto 30/06/2015 | 9880884166, info@ewardd.com |
| 6 | M/s. K.G. Nandini Enterprises, No.46/4, 46/5, Billakempanahalli village, BidadiHobli, Ramanagaram District. | 7,200 | E-waste recycling | Working | 30.06.2015 | Upto 30/06/2017 | 080-27204135/6/7 - info@kgnandinienterprises.com |
| 7 | M/s. Eco Birdd Recycling Company Pvt. Ltd., No. 185, AzeezSait Industrial Area, Nayandahalli, Mysore Road, Bangalore - 39. | 350 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2016 | 080-22748222-ecobird@gmail.com |
| 8 | M/s. FA Enterprises, No. B-08, KIADB Industrial Area, Tamaka, Kolar Dist. | 100 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2017 | 9845935227 |
| 9 | M/s. Ameena Enterprises, Shed No.C-199, KSSIDC Industrial Estate Hebbal, Mysore - 570 017. | 560 | E-waste recycling | Working | 30.06.2015 | upto 24/03/2012 | 9845591816 |
| 10 | M/s. E-R3 Solutions Pvt. Ltd, No.C-430, 1 st Cross, 1 st Stage | 290 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2017 | 080-28377316-support@er3so |

MARKET SURVEY OF REUSABLE E-PRODUCTS AND RECYCLED E-COMPONENTS

| | | | | | | | |
|----|--|----------------------------|---------------------|---------|------------|-----------------|--|
| | Peenya Industrial Area, Bangalore - 560 058. | | | | | | lutions.org |
| 11 | M/s. Trishyirya Recycling India Pvt. Ltd, No.315, 4 th Phase, Peenya Industrial Estate, Bangalore - 560 058. | 500 | E-waste recycling | Working | 30.06.2016 | upto 30/06/2014 | 080-2836122-prabhu.srinivasan@simsmm.com |
| 12 | M/s. Tech Logic, Unit-2, Shed No.36, 2 nd Main, Ranganathapura, Bangalore - 560 044 | 240 | E-waste recycling | Working | 30.06.2015 | upto 24/03/2017 | 080-23145453 |
| 13 | M/s. Samarthanam Trust for the Disabled, No. 66, 6 th main, 3 rd Phase, Peenya Industrial Area, Bangalore - 560 058. | 337.5 (printer cartridges) | E-waste recycling | Working | 30.06.2015 | upto 02/05/2012 | 080-26582570, mahantesh@samarthanam.org |
| 14 | M/s. Sai Recyclers, No. 20, KSSIDC Industrial Estate, Bhashettihalli, Versandara Post, Doddaballpura Town & Taluk, Bangalore Rural District. | 300 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2017 | 984548848, hari@saircyclers.com |
| 15 | M/s. Nobel Technology, No.46, 14 th Cross, 4 th Phase, Peenya Industrial Area, Bangalore - 596 058. | 300 | E-waste recycling | Working | 30.06.2015 | upto 30/11/2012 | 9845980509, nobel@itrecycle.in |
| 16 | M/s. Cerebra Integrated Technologies Ltd, Plot No. 422/2, 11 th cross, 4 th phase, 2 nd stage, Peenya industrial Area, Bangalore - 560 058. | 600 | E-waste recycling | Working | 30.06.2015 | upto 30/06/2017 | 080-22046969, bharath@cerebracomputers.com |
| 17 | M/s. Ecovision Recycling, No.D-65, Veerasandra Industrial Area, Hosur Road, Bangalore - 34. | 300 | E-waste recycling | Working | 30.06.2016 | upto 30/06/2017 | 022-66373500-shreyas.doshi@shrenuj.com |
| 18 | M/s. Royal Touch, No.3/2, Ezickle Industrial Estate, Ward No.94, K.G. Halli, AC Post, Nagavara Main Road, Bangalore - 560 045. | 90 | E-waste recycling | Working | 30.06.2016 | upto 31/12/2012 | royaltouch41@yahoo.in |
| 19 | M/s. Arrow Systems, No.SM 3, 4 th Phase, 3 rd stage, Peenya Industrial Area, Bangalore - 560 058. | 120 | E-waste Dismantling | Working | 30.06.2017 | Upto 30/06/2014 | govind@arrow systemsindia.com |
| 20 | M/s. Digicomp Complete Solutions Ltd, No.86, Ground floor, 3 rd cross, New Timber yard layout, | 180 | E-waste recycling | Working | 30/06/2017 | upto 30/06/2014 | 080-65832090, support@digicomp india.com |

MARKET SURVEY OF REUSABLE E-PRODUCTS AND RECYCLED E-COMPONENTS

| | | | | | | | |
|----|--|--------------|-----------------------------------|---------|------------|-----------------|---|
| | Mysore Road, Bangalore - 560 026 | | | | | | |
| 21 | M/s. Afeefa Spectro Alloys, Sy.No.289/1, Nagaragere village, GauribidnurTq, Chikkaballapura Dist. | 300 | E-waste recycling | Working | 30.06.2016 | upto 17/04/2013 | 080-41712575, afeefespectroalloys@gmail.com |
| 22 | M/s. H. M. G. Eco Care recycling Pvt. Ltd. No. C-22, 3rd Cross, KSSIDC Industrial Estate, Kumbalgodu, Mysore Road, Bangalore | 300 | E-waste recycling | Working | 30.06.2016 | upto 20/03/2013 | 9341254026, 9845371401 |
| 23 | M/s. E-Scrapy Recyclers, No. 106, Adrahalli main road, Byreshwara industrial area, Peenya 2nd stage, Bangalore-58 | 300 | E-waste recycling | Working | 30/06/2017 | upto 25/09/2014 | 9980997863, escrappyrecyclers@gmail.com |
| 24 | M/s. Eco-Ewaste Recyclers India Pvt Ltd, No.41/1, 42/2, 19 & 20, 2nd Cross, Mutachari Industrial Estate, Hanumanthappa Layout, Mysore Road, Bangalore-560039 | 300 | E-waste Dismantling & segregation | Working | 28/07/2012 | upto 30/06/2014 | 9886777865, ecoewaste@gmail.com |
| 25 | M/s. Epragathi (A system of Integrated System soft) Shed No. M, #405, 2nd Floor, 7th and 8th Cross, 1st Stage Peenya, Bangalore-560058 | 300 | E-waste Dismantling & segregation | Working | 30.06.2017 | upto 30/06/2015 | 9880267711, rajbh@integratedsystemssoft.com |
| 26 | M/s Hindustan Computers., No.V3 & V4, KIADB Industrial Area, Tamaka, Kolar. | 100 | E-waste Dismantling & segregation | Working | 30.06.2017 | upto 30/06/2014 | 9916079625 |
| 27 | M/s. Trackon E-waste Recyclers Pvt. Ltd, No.28, Gerupalya, 2nd Phase, Kumbalgodu Industrial Area, Bangalore - 560 074. | 300 | E-waste recycling | Working | 30.06.2014 | upto 30/06/2014 | 9845888986, trackonewaste2011@gmail.com |
| 28 | M/s Rashi E-waste., No.52/170 & 171, 6th Cross, Aziz Sait Industrial Town, Nayandahlli Post, Bangalore-560039. | 300 | E-waste Dismantling & segregation | Working | 30.06.2017 | Upto 30/06/2014 | 9880766700, shaila@rashiewaste.com |
| | M/s Rashi E-waste., No.52/170 & 171, 6th Cross, Aziz Sait Industrial Town, Nayandahlli Post, Bangalore-560039. | 48,00,000Nos | Processing of CFL Bulbs and Tubes | Working | 30.06.2017 | Upto 30/06/2014 | 9880766700, shaila@rashiewaste.com |

MARKET SURVEY OF REUSABLE E-PRODUCTS AND RECYCLED E-COMPONENTS

| | | | | | | | |
|----|--|-------|-----------------------------------|---------|------------|-----------------|--|
| 29 | M/s. Green Globe Enterprise, No. 108/7, 5th Cross, Singasandra Industrial Area, Hosur Road, Bommanahalli, Bangalore-68. | 79 | E-waste Dismantling | Working | | upto 09/09/2015 | 9448467026 |
| 30 | M/s 4R Recycling Pvt Ltd, Shed No A-5, Industrial Estate, Peenya 3rd Stage Industrial area, Nallakadirenahalli Village, YeshwanthpurHobli, Bangalore North Taluk, Bangalore. | 600 | E-waste Dismantling & recycling | Working | 30.06.2018 | | |
| 31 | M/s TES-AMM Indian Pvt Ltd, No A-365, 6th cross, I stage, Peenya Industrial Estate, Bengaluru 560058 | 12000 | E-waste Dismantling & segregation | Working | 30.06.2018 | Upto 04.09.2015 | 9841120734, aru@tes-amm.net |
| 32 | E-Waste managers, No.C-311/c, 9th cross, Near T.V.S Cross, peenya industrial estate, bangalore | 300 | E-waste Dismantling | Working | 30.06.2017 | upto 30.6.2015 | 9845000892, ewastemanagers@gmail.com |
| 33 | Shobith Industry-unitII, survyey no. B-4/1, KSSIDC Industrial area | 300 | E-waste Dismantling | Working | 30.06.2018 | upto01.12.2015 | 9845463830, shobithindustries@rediffmail.com |
| 34 | XL Engineering and fabricators, No.B-188, 5th main II Stage, Peenya, Industrial area, bangalore-58 | 34 | E-waste Dismantling | Working | 30.06.2018 | upto 26.12.2015 | 080-28360720, 9844033720 |

ANNEXURE-XVI



ANNEXURE-XVI



Year wise details of IT equipment Procured and Disposed off

Name of the department/organization:

Total number of employees:

| Year | No. of IT equipments procured | | | | | | No. of IT equipments disposed | | | | | |
|--------------|-------------------------------|---------|----------|------|---------------|-------|-------------------------------|---------|----------|------|---------------|-------|
| | Computers(PCs) | Laptops | Printers | UPSs | Others if any | Total | Computers(PCs) | Laptops | Printers | UPSs | Others if any | Total |
| (1) | (2) | | | | | | (3) | | | | | |
| 2003-04 | | | | | | | | | | | | |
| 2004-05 | | | | | | | | | | | | |
| 2005-06 | | | | | | | | | | | | |
| 2006-07 | | | | | | | | | | | | |
| 2007-08 | | | | | | | | | | | | |
| 2008-09 | | | | | | | | | | | | |
| 2009-10 | | | | | | | | | | | | |
| 2010-11 | | | | | | | | | | | | |
| 2011-12 | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | |

1. Procurement of IT equipments by the Department is :

Centralized Decentralized

2. Which among the following processes are generally followed for procurement of the IT equipments (computers, laptops, printers etc.)?

- 1. Open Tender
- 2. Limited Tender through e-governance empanelled vendors
- 3. DGS&D (Rate contract)
- 4. Through KEONICS

3. Does the Department have a disposal policy for IT equipments? Yes No

3.1 If Yes, then what is the policy followed?

3.2 If No, then till now how IT equipments have been disposed?

4. On an average what is the average lifespan of the following IT equipment:

| Equipments | 3yrs | 5yrs | < 5yrs |
|-----------------------|------|------|--------|
| Computers(PCS) | | | |
| Laptops | | | |
| Printers/Fax machines | | | |
| UPS systems | | | |
| If any other(specify) | | | |

5. Do you discard your IT equipments after their lifetime is over? Yes No

6. Kindly fill in the following information:

| Equipments | On an average what percentage of the following IT equipments are discarded by you each year? | On an average what percentage of the following IT equipments are donated by you each year? | On an average what percentage of the following IT equipments do you use even after their lifespan is over each year? | For how many extra years (after their lifespan is over)you use the IT equipments before discarding them? |
|-----------------------|--|--|--|--|
| Computers(PCs) | | | | |
| Laptops | | | | |
| Printers/Fax machines | | | | |
| UPS systems | | | | |
| Others(specify) | | | | |

Suggestions / Recommendations with regards to management of e-waste

Date:

Place:

ANNEXURE-XVII

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ: ನೀಸಸೂಾ 02 ವಿಮಾಂಕ 2010

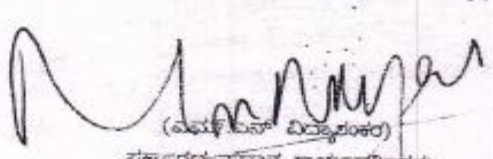
ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ,
ಬಹುಮಹಡಿ ಕಟ್ಟಡ,
ಬೆಂಗಳೂರು, ದಿನಾಂಕ 11.1.2010.

ಸುತ್ತೋಲೆ

ವಿಷಯ: ಹಳೆಯ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರ ಪರಿಕರಗಳ ವಿಲೇವಾರಿಯ ಬಗ್ಗೆ
ಉಲ್ಲೇಖ: ದಿನಾಂಕ 29.9.2009ರಂದು ನಡೆದ ರಾಜ್ಯ ಮಟ್ಟದ ತಾಂತ್ರಿಕ ಸಲಹಾ ಸಮಿತಿ ಸಭೆಯ ನಡವಳಿಗಳು.

ಕಲವಾರು ಇಲಾಖೆಗಳು ತಮ್ಮಲ್ಲಿರುವ ಹಳೆಯ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರ ಪರಿಕರಗಳನ್ನು ವಿಲೇವಾರಿ ಮಾಡುವ ಬಗ್ಗೆ ಸರ್ಕಾರದ ಅಭಿಪ್ರಾಯ/ಅನುಮತಿಯನ್ನು ನೀಡುವಂತೆ ಕೋರಲಾಗುತ್ತಿದೆ. ಹಳೆಯ ಗಣಕಯಂತ್ರ ಮತ್ತು ಇತರ ಪರಿಕರಗಳ ವಿಲೇವಾರಿ ಬಗ್ಗೆ ಈ ಹಿಂದೆ ದಿನಾಂಕ 18.6.1998ರಲ್ಲಿ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಮತ್ತು ಜೈವಿಕ ತಂತ್ರಜ್ಞಾನ ನಿರ್ದೇಶನಾಲಯ (ಹಿಂದಿನ ಕರ್ನಾಟಕ ಸರ್ಕಾರಿ ಗಣಕ ಕೇಂದ್ರ) ಮಾರ್ಗಸೂಚಿಯನ್ನು ನೀಡಲಾಗಿತ್ತು. ಸದರಿ ವಿಷಯದ ಬಗ್ಗೆ ಸರ್ಕಾರದ ಅವರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ದಿನಾಂಕ 29.9.2009ರಲ್ಲಿ ನಡೆದ ರಾಜ್ಯ ಮಟ್ಟದ ತಾಂತ್ರಿಕ ಸಲಹಾ ಸಮಿತಿಯು, ವಿವರವಾಗಿ ಚರ್ಚಿಸಿ ಕೆಳಕಂಡ ವಿಧಾನದಲ್ಲಿ, ಹಳೆಯ ನಿರುಪಯುಕ್ತ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರ ಗಣಕ ಪರಿಕರಗಳನ್ನು ವಿಲೇವಾರಿ ಮಾಡಲು ಅನುಮೋದನೆ ನೀಡಿದೆ.

- ಹಳೆಯವನ್ನು ಕೊಟ್ಟು ಹೊಸದನ್ನು ಕೊಳ್ಳುವುದು(Buy-back):**
 - ಇಲಾಖೆಗಳು ಹೊಸದಾಗಿ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರ ಗಣಕ ಪರಿಕರಗಳನ್ನು ಖರೀದಿಸುವಾಗ, ಕೆಂಡರ್ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಹಳೆಯ ಗಣಕಯಂತ್ರ ಹಾಗೂ ಇತರ ಪರಿಕರಗಳ ವಿವರಗಳನ್ನು ನೀಡಿ, ಹೊಸ ಉಪಕರಣಗಳ ದರವೊಂದಿಗೆ, ಹಳೆಯ ಉಪಕರಣಗಳಿಗೆ ಮರಳಿ ಪಡೆಯಲು ನೀಡುವ ದರಗಳನ್ನು (Buy-back rate) ನೀಡುವಂತೆ ಕೆಂಡರ್‌ಗಳಲ್ಲಿ ಸೂಚಿಸಬೇಕು.
 - ಸರಬರಾಜು ಸಂಸ್ಥೆಗಳು ಸಲ್ಲಿಸುವ ಹೊಸ ಉಪಕರಣದ ದರದಲ್ಲಿ ಹಳೆಯ ಉಪಕರಣಕ್ಕೆ ನೀಡುವ ದರವನ್ನು ಕಳೆದು, ಒಟ್ಟಾರೆ ಅತಿ ಕಡಿಮೆ ದರ ಸೂಚಿಸಿದ ಸಂಸ್ಥೆಯನ್ನು ಎಲ್-1 ಸಂಸ್ಥೆ ಎಂದು ಪರಿಗಣಿಸುವುದು.
- ಸಾರ್ವಜನಿಕ ಹರಾಜು ಮೂಲಕ:**
ಸರ್ಕಾರ ಹೊರಡಿಸಿದ ನಿಯಮಾನುಸಾರ, ಸಾರ್ವಜನಿಕವಾಗಿ ಹರಾಜು ಮೂಲಕ ವಿಲೇವಾರಿ ಮಾಡುವುದು.


 (ಎಚ್.ಬಿ.ಎನ್. ವಿದ್ಯಾಕಂಠರ)
 ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು,
 ನೀಸಸೂಾ(ಇ-ಆಡಳಿತ)

11/01/10

ಇವರಿಗೆ:

ಮಾಹಿತಿಗಾಗಿ:

1. ಸರ್ಕಾರದ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು.
2. ಸರ್ಕಾರದ ಅವರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು.
3. ಸರ್ಕಾರದ ಅಭಿವೃದ್ಧಿ ಅಯುಕ್ತರು.
4. ಸರ್ಕಾರದ ಎಲ್ಲಾ ಅವರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು ಮತ್ತು ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು.
5. ಸರ್ಕಾರದ ಎಲ್ಲಾ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು ಮತ್ತು ಕಾರ್ಯದರ್ಶಿಗಳು.
6. ಎಲ್ಲಾ ಇಲಾಖಾ ಮುಖ್ಯಸ್ಥರು. P.H., ಮೈಸೂರು

ANNEXURE-XVII(Translated version)

Government of Karnataka

No. DPAR 20 VMA 2010

Karnataka Government Secretariat
M.S. Building, Bangalore
Date: 11.1.2010

Circular (translated version)

Sub: Disposal of old computers and other accessories-reg.

Ref: Proceedings of the Standard Technical Advisory Committee meeting held on 29.0.2009

In order to dispose of their computers and other accessories, many departments are requesting the Govt. to give its opinion/order in this regard. Earlier the IT, Bt directorate (formerly named as Karnataka Govt. Computer Centre) had issued guidelines dated 18.01.1998 with reference to the disposal of old computers and other accessories. The State Level Technical Advisory Committee under the chairmanship of Additional Chief Secretary on 29.9.2009 discussed in detail and approved the following procedure to be followed for disposal of computers and other accessories.

1. Through Buy-Back:

- 1.1. Whenever the department call for tender for purchasing the new computers and other computer accessories, they should mention in the tender a direction for the tenders to indicate buy-back rate along with the new rate.
- 1.2. The rate of the new equipments quoted by the suppliers after deducting the buy-back rate the supply agency which quotes the lowest of such rate is to be considered L1.

2. Through Public auction to dispose-off the computer and other accessories as per the guidelines issued by the Governments issued by the Government.

Sd/-
M.N. Vidyashankar
Principal Secretary
DPAR (e-Governance)

To,
For information

1. Chief Secretaries of the Government
2. Additional chief Secretaries of the Government
3. District Commissioners
4. All Additional Commissioners and Principal Secretaries
5. All head of departments.

ANNEXURE-XVIII

पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

Rajiv Gauba
Joint Secretary
Tel: 011-24360634

D.O. No.20-3/2008-HSMD

Dated the 4th August, 2010

Dear Sir/Madam,

The Ministry of Environment and Forests has been implementing a Central Sector Scheme (CSS) for setting up of treatment and disposal facilities, on Public Private Partnership (PPP) basis, for environmentally sound disposal of hazardous and bio-medical wastes.

2. Under this scheme, Government of India provides financial assistance up to Rs.2.00 crores for setting up of a Treatment, Storage and Disposal Facility (TSDF) for industrial hazardous wastes and up to Rs.10 lakhs for a Common Bio-Medical Waste Treatment and Disposal Facility (CBMWTF).

3. The status of the existing treatment and disposal infrastructure in the country has been reviewed. There is a significant gap between the generation of wastes of the aforesaid categories and the availability of treatment and disposal facilities. In order to incentivise setting up of adequate number of treatment and disposal facilities, the scheme for providing financial assistance has been revamped. The salient features of the revised scheme are as follows:

- (i) The scheme would cover E-Waste recycling and treatment facilities.
- (ii) For establishment of TSDFs for hazardous wastes, CBMWTFs for bio-medical wastes and E-waste recycling facilities, up to 25% of the total project cost would be provided as central subsidy, subject to matching grant by the State/UT government concerned. In case of NE States, up to 50% of the total project cost would be provided as central subsidy, subject to 25% contribution by the State government concerned. The balance amount required for the project would have to be contributed by the entrepreneur setting up the treatment/recycling facility.
- (iii) The central subsidy would be limited to a maximum of Rs.13.75 crores for TSDF, Rs.7.5 crores for SLF, Rs.12.5 crores for E-waste recycling facility and Rs.1 (one) crore for CBMWTF. In case of NE States, the central subsidy would be limited to Rs.22.5 crores, Rs.15 crores, Rs.25 crores and Rs.2 crores, respectively, for the aforesaid categories of treatment/recycling facilities.
- (iv) For calculation of central subsidy, the total project cost would not include the cost of land.

Contd....2/-



जहाँ है हरियाली।
वहाँ है खुशहाली।।


पर्यावरण भवन, सी.जी.ओ. कॉम्प्लेक्स, लोदी रोड, नई दिल्ली - 110 003
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI - 110 003

-2-

- (v) The cost of land provided by the State/UT government will be considered for calculating the contribution of the State/UT government.
- (vi) While considering grant of central subsidy, preference will be given to proposals where State/UT government provides matching financial contribution, over and above land provided free of cost or at a concessional rate.
4. Detailed criteria for providing central subsidy are given in the Annexure. These may be kept in view while submitting proposals for financial assistance.
5. The State/UT governments are requested to take necessary action on the following lines for setting up of waste treatment and disposal facilities in their States/UTs:
- (i) Identify suitable lands for setting up of TSDFs/SLFs/Integrated E-Waste Recycling and Treatment Facilities/CBMWTDFs as per CPCB guidelines.
- (ii) Invite proposals from the prospective entrepreneurs for setting up of TSDF/SLF/Integrated E-Waste Recycling and Treatment Facility/ CBMWTDF and forward them along with confirmation regarding availability of land, commitment of the State/UT Government's matching contribution and NOC of the SPCB/PCC concerned for setting up the project.
- (iii) Separate proposals should be sent for setting up of each category of treatment and disposal facilities.
6. Proposals along with Detailed Project Reports (DPRs) may be forwarded at the earliest to enable this Ministry to process them for sanction of central subsidy during the current financial year. This may kindly be given priority.

With regards,

Yours sincerely,


04/08/20
(Rajiv Gauba)

To

Secretaries of all State Environment Departments.

Copy to:

- (1) Chairpersons of all SPCBs/PCCs.
(2) Secretaries of all State/UT Urban Development Departments.
(3) Secretaries of all State/UT Health Departments.
(4) The Chairman, CPCB, Parivesh Bhawan, Delhi-32.

AnnexureCriteria for providing Central Subsidy

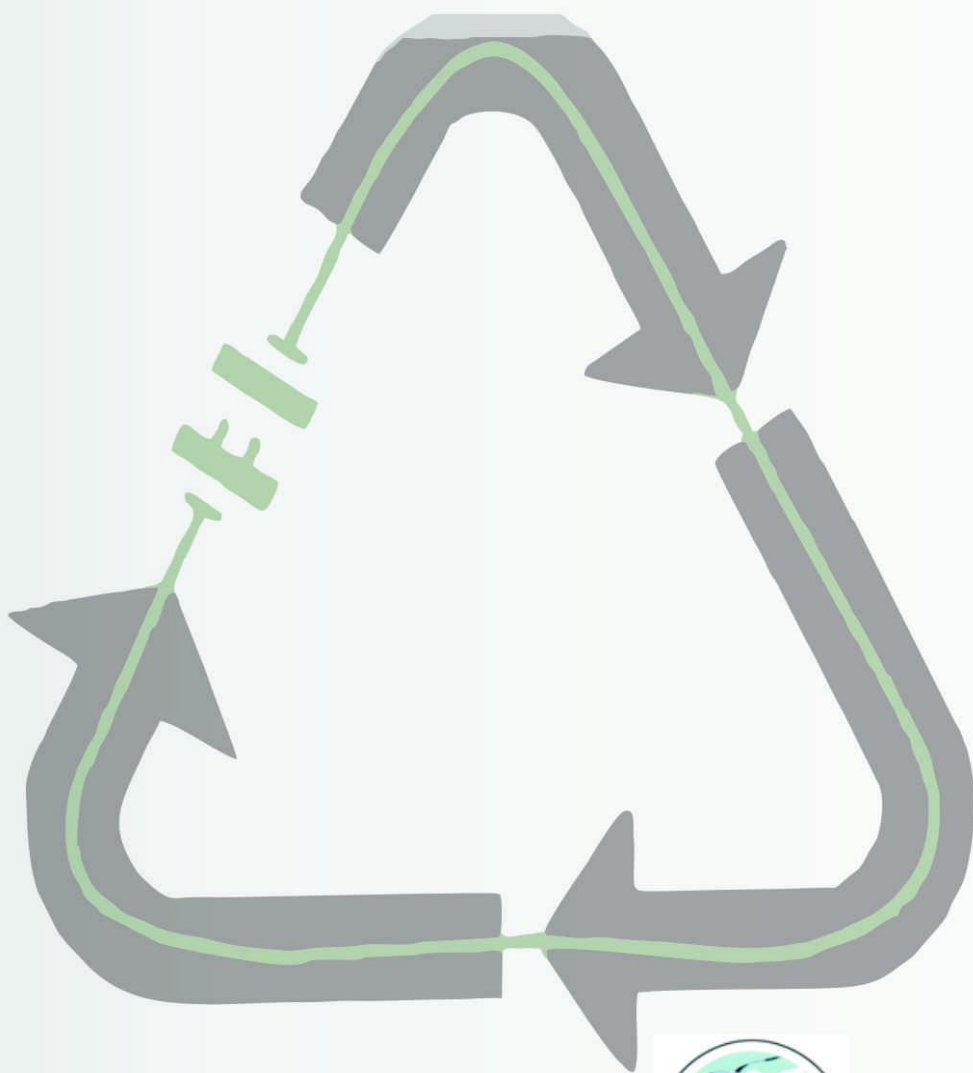
- (1) For establishment of treatment and disposal facilities for hazardous wastes, viz., Treatment, Storage and Disposal Facility (TSDF), Secured Land Fill (SLF), Integrated E-Waste Recycling and Treatment Facility and Common Bio-Medical Waste Treatment and Disposal Facility (CBMWTDF), up to 25 % of the total project cost would be provided as central subsidy. In case of NE States, up to 50 % of the total project cost would be provided as central subsidy, subject to 25% of the project cost being contributed by the State Government concerned and the balance 25% of the project cost being contributed by the entrepreneur.
- (2) The central subsidy would be limited to a maximum of Rs.13.75 crores for a TSDF and Rs.7.5 crores for a SLF. In case of Integrated E-Waste Recycling and Treatment Facility, the ceiling for central subsidy would be Rs.12.50 crores. In respect of a CBMWTDF, the ceiling for central subsidy would be Rs.1 crore.
- (3) In case of NE States, the central subsidy would be limited to a maximum of Rs.27.5 crores for a TSDF and Rs.15 crores for a Secured Land Fill (SLF). In case of Integrated E-Waste Recycling and Treatment Facility, the ceiling for central subsidy would be Rs.25 crores. In respect of a CBMWTDF, the ceiling for central subsidy would be Rs.2 crores.
- (4) Proposals for central subsidy would be considered subject to commitment of matching grant by the State/UT Government. The balance amount would have to be contributed by the entrepreneur setting up the common treatment and disposal facility.
- (5) The total cost of project would not include the cost of land, for calculation of central subsidy.
- (6) The cost of land, if provided by the State/UT Government, will be considered for inclusion in the matching contribution of the State/UT Government.
- (7) The computation of the value of the land would be based on the current government valuation notified by the competent revenue authorities.
- (8) However, State government's matching contribution would not include the cost incurred by it for infrastructure development.
- (9) While considering grant of central subsidy, preference will be given to proposals where state government provides matching financial contribution over and above land provided free of cost or at a concessional rate.

Contd...2/- (PTO)

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- (10) The central subsidy will be provided based on the techno-economic feasibility study of the project. The Detailed Project Report (DPR) prepared by the entrepreneur would be appraised by an independent empanelled agency. This agency will also be entrusted with Third Party Evaluation during implementation of the project.
- (11) A copy of NOC or consent to establish issued by SPCB/PCC concerned, would be required to be submitted along with the proposal.
- ✓(12) The 1st installment of the central subsidy would be released only after receiving commitment from the State/UT government/SPCB regarding its matching contribution and subsequent central releases would be sanctioned only after the matching financial contribution of the state government has been released.
- ✓(13) The entrepreneur should submit a commitment to contribute the balance amount required for the project, along with a statement providing details of availability of the funds towards this contribution.
- (14) The proposal should provide a detailed time-frame for completion of the project and various components thereof.
- ✓(15) The revised pattern of central subsidy will be available for new facilities or for expansion of existing facilities.

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