

## E- WASTE MANAGEMENT

-VIJAY KUMAR SHARMA<sup>1</sup>

### **Introduction:**

It is a rigid fact that with the large increase in use of electric devices to bridge the digital divide, there is also a disturbing growth of e-waste worldwide. e-waste is defined as “waste electrical and electronic equipment, whole or in part or rejects from their manufacturing and repair process, which are planned to be rejected”.

There is a need for e-waste management as e-waste components may cause severe health risks and environmental damage, when crude, unscientific methods are applied for recovery of useful components. There is a need to encourage recycling of all useful and valuable material from e-wastes to preserve the natural resources.

Most of the developing countries are suffering with the rapidly growing problems of e-waste and have to have sound e-waste management systems for end of life electronic products to avoid the threat on environment and mankind.

### **Meaning of E-Waste**

Many researchers had given their insights and findings on e-waste and related topics since this problem under study start itching the society and intensity starts increasing exponentially. **Electronic-waste** is also known as **E-waste**, very trendy yet casual name given to electrical and electronic appliances & gazettes, either discarded or of further use. According to California Integrated Waste Management Board Mobile phones, Computers, televisions, VCRs, Music Systems, Photo copier, wax and other printers fall under this category. It is not very clear to add home appliances in this solid waste or not. But yet they are considered as either electronic or electrical products.

**Wang** [1] write in detailed that electronic & electrical waste is actually a family and it has many branches which includes all personal, commercial, educational, transportation, private or public products which mainly work on power and have some at least sort of automation to function to meet the requirement. **Kohler** [2] explained that the home appliance like automatic ovens, fridge or chilling machines and many others which

---

<sup>1</sup> student of B.A.LL.B (H), ICAI UNIVERSITY, JAIPUR

also work on programming and computer related activities are very difficult to differentiate from WEEE (Waste Electrical and Electronic Equipment) as they are also part of either electrical or electronic family. ***Electronic waste" or "E-Waste"*** may be defined as discarded computers, office electronic equipment, entertainment device electronics, Mobile Phones, Television Sets, and Refrigerators. This includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal. Others are re-usable (working and repairable electronics) and secondary scrap (copper, steel, plastic, etc.) to be "commodities", and reserve the term "waste" for residue or material which is dumped by the buyer rather than recycled, including residue from reuse and recycling operations, because loads of surplus electronics are frequently commingled (good, recyclable, and non-recyclable), several public policy advocates apply the term "e-waste" broadly to all surplus electronics. Cathode Ray Tubes (CRTs) are considered one of the hardest types to recycle.

Goods consisting of Computers, Mobile Phones, Monitors, Keyboards, Video Cameras, CDs, Photocopiers, Televisions, Microwave Ovens, Washing Machines, VCRs, Dishwashers, Fax Machines, Digital Cameras etc are usually called as ***Electrical and Electronic Equipment (EEE)*** or e product. In current previous change and requirement on use of e products has increased expressively. After use and end of life in exponential growth of increasing amounts of wastes termed as waste of electrical and electronic equipment (WEEE) or alternately as e-waste. E-waste is a highly multipart waste stream which contains both very sporadic and valuable as well as very poisonous mechanisms. As per UN inspection of 2009 every year 20 to 50 million tons of e-waste are produced worldwide. By 2020 e-waste from old computers in South Africa and China will grow by 200-400% and by 500% in India whereas for mobiles it will be 7 times higher in China and 18 higher in India compared to 2007. For effectively tackling problem of e waste many countries notwithstanding of developed or developing and immature in nature create individual regulations, Laws, Principles and Creativities to challenge the huge development problem of e waste.

The electronics industry is the world's major and wildest growing manufacturing industry. In the last few years, it has played an important part in socio - economic and high-tech growth of cultures. The Basel resolution describes wastes as ingredients or objects which are disposed of or are planned to be disposed of by the provisions of national laws. There are so many kinds of wastes and e-waste is one of its types. Electronic waste or e-waste for short is a basic term embracing various forms of electric and electronic equipment that have terminated to be of any value to their holders.

Two major problems are related with generation of ***WEEE*** including the large capacity generated and safe environmental removal of e-waste. Studies directed have shown that about 3.3 hundred thousand tons of e-

waste is produced yearly in India and the total generation of e-waste was almost about 4.8 tons by 2011 as predicted. **E-waste** contains valuable constituents such as expensive and planned metals like silver, gold and copper and hence is economically viable to reutilize. The processes include disassembly of the e-waste and the extraction of valuable materials which poses environmental and health hazards, if such recycling activities are carried out by the informal sector in an unregulated manner. Since the recovery and extraction procedures in the informal sector are highly tolerant, use of crude and highly hazardous techniques is used for processing and extraction of recoverable by-products from the e-waste. The role of informal sector in collection, segregation and dismantling plays a beneficial role both environmentally and socially. The social benefits are due to retaining and creating jobs in the sector in the process of ensuring naturally sound recycling of e-waste. This implies that the role of the informal sector is essential even when an economy graduates from an unregulated to a regulated system. The paper discusses the appearance of e-waste in India, existing legislations and provides sound management strategies for dealing with huge volumes of generation of e-waste in India. Rapid changes in invention, changes in media (tapes, programming, MP3), falling costs, and settled out of date quality have carried about a rapidly developing excess of electronic waste the world over.

**E-waste encompasses ever growing range of obsolete products classified as: -**

- ❖ Electronic gadgets, for example, PCs, servers, fundamental edges, screens, TVs and show gadgets.
- ❖ Media transmission gadgets, for example, phones and pagers, number crunchers, sound and video gadgets, printers, scanners, fax machines, coolers, climate control systems, clothes washers, and microwaves.
- ❖ Recording gadgets, for example, DVDs, CDs, floppies, tapes, printing cartridges, military electronic waste, car exhaust systems.
- ❖ Electronic hardware, for example, chips, processors, mother sheets, printed circuit sheets, modern gadgets, for example, sensors, alerts, alarms, security gadgets, car electronic instruments.
- ❖ A common perspective of e-waste as a ware purposes a hesitance to discard e-waste promptly, although modest motivating forces through promotion have been utilized for empowering transfer among shoppers. With humble recuperation rates to formal recyclers being regular crosswise over India, bring

down enactment consistence costs and the capacity to externalize huge ecological costs, the casual reusing part can out-contend the formal division, including cutting edge recyclers, in offering for e-waste in India.

### **E-waste in Indian Context**

The trouble of e-waste streams inside India and rare record keeping by industry members make the estimation of the age of e-waste inside India troublesome. Although no clear authority information are accessible projections in light of free examinations led by the NGOs or government organizations are frequently detailed. For instance, as per the Comptroller and Auditor-General's (CAG) report, more than 7.2 MT of mechanical unsafe waste, 4 lakh huge amounts of electronic waste, 1.5 MT of plastic waste, 1.7 MT of restorative waste, 48 MT of metropolitan waste are produced in the nation every year. The Central Pollution Control Board (CPCB) evaluated India's e-waste at 0.573 MT for every day in 2005. Strangely, reports from an investigation constrained to examination of PCs, cell phones and TVs tallied that around 382,979 tons of e-waste was produced in 2007, of which 50,000 tons (13%) were unlawfully foreign made. Of the e-waste imported into India, it is evaluated that around 80% is foreign from the US, while the staying 20% is for the most part imported from the EU. Be that as it may, since of part of these merchandise are foreign made by means of third markets, the unwavering quality of such insights is flawed.

The state-wise separation of the age of **WEEE** in India was accounted for in a point by point ponder completed in 2005. Among the 10 biggest **e-waste** producing States, Maharashtra positions originally pursued by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab. The principle wellsprings of electronic waste in India are the administration, open and private (mechanical) divisions, which represent just about 70 % of aggregate waste age. The commitment of individual families is moderately little at around 15 %; the rest being contributed by producers. An Indian statistical surveying Bureau (IMRB) study of 'E-waste age at Source' led in 2009 found that out of the aggregate e-waste volume in India, TVs and work areas including servers involved 68 for every penny and 27 for every penny separately. Imports and cell phones included 2 for every penny and 1 for every penny individually.

The household advertise is getting renewed because of light financial development and changing utilization designs. This development has noteworthy financial and social effects. The expansion of electronic items, utilization rates and higher out of date quality rate prompts higher age of electronic waste (e-waste). The expanding outdated nature rates of electronic items added to the immense import of garbage hardware from abroad make complex situation for strong waste administration in India.

### **E-waste in Global Context**

E-waste is the quickest developing metropolitan waste over the world, and in excess of 50 MT of e-waste is created internationally consistently. The created western economies represented just 2 % of the aggregate strong waste produced in created nations by 2010. Creating nations with expanding shopper base and a foreseen ascend in the offers of electronic items in these nations because of their substantial planned interest would encounter fast monetary and modern development alongside the gigantic amount of e-waste age that will be of genuine concern. Ongoing investigations completed by UN reports that e-waste from old PCs would hop by 400 % in China and by 500 % in India on 2007 levels by 2020. Further, e-waste from disposed of cell phones would be around seven times higher in China and, 18 times higher in India than 2007 levels by 2020. Such forecasts feature the earnest need to address the issue of e-waste in creating nations like India where the gathering and administration of e-waste and the reusing procedure is yet to be legitimately controlled. As per the UNEP, China, India, Brazil, Mexico and others would confront rising natural harm and medical issues if e-waste reusing were left to the casual segment. According to the Inventory Assessment Manual, it is evaluated that the aggregate e-waste created in the EU is around 14-15 kg for each capita or around 5MT to 7MT for every annum though India and China, contributes under 1kg. In Europe, e-waste represents 6 million tons of strong waste per annum. The e-waste age in the EU is relied upon to develop at a rate of 3 for every penny to 5 for every penny for each year.

A major reason for the rapid generation of e-waste and the resulting growth of the recycling market can be found in the high rate of obsolescence in the electronics market.

- **Japan**

There is no particular meaning of WEEE/E-waste as characterized in the administrative framework. E-waste is secured under laws to advance reusing inside Japan. The two noteworthy laws covering wide scope of E-waste things are "The Law for Recycling of Specified Kinds of Home Appliances (Home Appliances Recycling Law)" authorized in 1998 and "The Law for Promotion of the Effective Utilization of Resources" instituted in 2000.

In "The Law for Promotion of the Effective Utilization of Resources", E-waste is secured under "Utilized merchandise and results" which have been created and their extensive part is disposed of. This law covers PCs (home and office) and other electronic things. As indicated by this law "Utilized merchandise" implies any articles that are gathered, utilized or unused, or is discarded (aside from radioactive materials or those polluted along these lines). "Side-effect" implies any articles acquired optionally during the time spent assembling, preparing, repair or offer of the item; during the time spent supply of vitality; or during the time spent development relating to design and structural building (hereinafter alluded to as "development work") with the exception of radioactive materials or those sullied in this manner.

- **USA**

As per USEPA, Electronic items that are "close" or toward the "finish of their helpful life" are alluded to as "e-waste" or "e-scrap." Recyclers lean toward the expression "e-scrap" since "squander" alludes just to what is left after the item has been reused, recouped or reused. In any case, "E-waste" is the most ordinarily utilized term. In created nations, presently, it measures up to 1% of aggregate strong waste age and is relied upon to develop to 2% by 2010. In USA, it accounts 1% to 3% of the aggregate metropolitan waste age. In EU, truly, **e-waste** is growing three times quicker than normal yearly metropolitan strong waste age. An ongoing source appraises that aggregate sum of **e-waste** age in EU ranges from 5 to 7 million tons for each annum or around 14 to 15kg for every capita and is relied upon to develop at a rate of 3% to 5% every year. In creating nations, it ranges 0.01% to 1% of the aggregate metropolitan strong waste age. In **China** and **India**, however yearly age per capita is under 1 kg, it is developing at an exponential pace.

### **Issues and Challenges**

The most basic issue for e-waste organization in India is the establishment of gathering pipelines that convey the loss from the generator to the recycler. Starting at now, most of the material that achieves the recyclers is reused in a way that slights the environmental, prosperity and security guidelines.

Further, improvement of serviceable models is required which are reasonable for the Indian conditions and which are sponsored by the administration approaches. Since waste organization has clear societal advantages, government enactments ought to give assistance, intercession and motivations for legitimate working of these models. In the Indian setting, because of the nearness of profoundly sloppy area, the job of the organization is incredibly expanded and ought to include deliberate endeavours to instruct the majority for expanding the agreeableness of the new practices.

There is a basic need of absorbing both sorted out and sloppy areas to make a down to earth reusing model for e-waste reusing. Specifically, disorderly area needs to comply with composed segment for better temperate and condition amicable answers for e-waste organization in India.

### **Legal Position in India**

The issue of electrical and electronic tool clearance, trade-in and remanufacturing has become the subject of stern discussion and debate among the Government organizations, environmentalist groups and the private segment manufacturers of computers and end-user electronic equipments. The Department of Parliamentary Standing Committee on Science & Technology, environment & Forests in its 192nd Report on the Functioning of *the Central Pollution Control Board (CPCB)*, has concluded that e-waste is going to be a big problem in the future due to modern life style and increase in the living standards of people and augmentation of financial expansion. The Committee has suggested a proactive role for the CPCB by stating that it “should conduct studies to make future projections and devise steps to check the menace”[3]. With the advancement stride that the India has made in the information technology segment and the electronic industry, the issue of trade-in of e-waste and its handling and clearance has assumed significance. The issue was brought to the notice of Parliament and Government on 23 December 2005 when a Private Member’s *Bill on The Electronic Waste (Handling and Clearance) Bill, 2005* was introduced in Rajya Sabha by Shri *Vijay J. Darda, Hon’ble Member from Maharashtra*. The Bill had recognized that while there was no appropriate law or guideline on the handling and clearance of electronic waste in the India, every home had a number of electronic goods. And once these goods became obsolete or redundant, they were either thrown in the garbage or found their way to scrap dealers in the course of the *Kabari wala’s* who then dismantled the gadgets, kept what was useful and threw the rest in landfills. Criticizing the improper way of clearance as the electronic goods contain various elements which are perilous to health and environment, the Bill called for a

regulation of e-waste clearance before the situation reached alarming proportions. The Bill sought to facilitate for appropriate handling and clearance of millions of tonnes of e-waste being generated by redundant electronic devices by prescribing norms and fixing responsibilities and duties on manufacturers, remanufacturers and end-users with regard to the clearance of e-waste and for all matters connected to it. ***The Bill, even, lapsed in July 2010*** with the expiry of the tenure of the honorable member in the Rajya Sabha, but initiated a public urge of effective e-waste law in India. In India, the Constitution assigns solid waste management as a primary liability to the Municipalities under the Twelfth Schedule [4]. ***Article 243W*** empowers the State Legislatures to frame legislations in respect of waste management. The ***Municipal Solid Wastes (Management & Handling) Rules, 2000*** were enacted by the Central Government which came into force from 25 September 2000. Some of the guidelines for handling municipal solid wastes provided in the Schedules are relevant for the management of e-waste and can be used as a model in the e-waste remanufacturing and clearance scheme. The guidelines include organizing house to house assortment of waste i.e., appropriate assortment of waste from slums and squatters, hotels, restaurants, office complexes and commercial areas, organizing awareness programmes for segregation of wastes, adopting suitable waste processing technologies and restricting land filling for non biodegradable inert waste. The Rules were examined by the Committee on Subordinate Legislation of Rajya Sabha. In its 186th Report on the said Rules adopted and presented to the Parliament in December 2009, the Committee while expressing concern on the inadequate and ineffective State laws, acknowledged the financial and technological constraints faced by Municipalities in the execution of the Rules. Furthermore, the Committee observed that with increasing urbanization finding landfill sites was going to get difficult for the ever increasing volumes of solid waste. The concerned Governments had to make sure that in the interest of public health, such landfill sites were located in „distant isolated places. The Rules had to facilitate a safe buffer between landfill sites and human settlement. It may be mentioned that after the enactment of the Environment Protection Act, 1986, ***the Central Pollution Control Board (CPCB)*** was delegated the functions to implement rules on perilous wastes, bio-medical wastes, municipal solid wastes and plastic wastes. Under the purview of the CPCB, the Division of Perilous Waste Management has been overseeing the management of e-waste. According to the CPCB, there are 36,165 industries in the India generating regarding 6.2 MT (Metric Tonnes) perilous waste every year, of which landfill able waste is 2.7 MT, incinerable waste 0.41 MT and recyclable perilous waste 3.08 MT. Besides, as per the Department of Commerce, Ministry of Commerce and Industry, Government of India, over 10,000 items, together with perilous items, are trade-in to India. These items are classified under

various heads. The category others is given to those items that cannot be classified under any head. It is this category that traders often end up misusing to trade-in perilous waste.

### **Regulatory regime for e-waste**

While the *Municipal Solid Waste (Management and Handling) Rules, 2000* regulates the clearance of municipal solid wastes in an ecologically acceptable manner and the Hazardous Waste (Management, Handling & Trans boundary) Rules, 2003 define and regulate all aspects of the perilous waste, there are no precise ecological laws for the management and clearance of e-waste. None of the existing ecological laws has any direct reference to the electronic waste or its handling as perilous in nature. Even, there are several provisions in these laws which have been applied to various aspects of the electronic waste.

#### **1. The Hazardous Waste (Management and Handling) Rules, 2003 In 1986,**

India enacted its first comprehensive ecological law, namely, the Ecological (Protection) Act, 1986 (EPA) after the Bhopal Gas tragedy and as a commitment under the Stockholm Conference [5] in 1972. Section 3 of the Environment (Protection) Act, 1986, gives all encompassing powers of setting standards, laying down procedures and supervision on the Central Government. The Rules under the EPA bestows upon the Union Government comprehensive powers to “take all such measures as is necessary or expedient for the purposes of protecting and improving the quality of environment and preventing, controlling and abating ecological pollution.” In furtherance to the execution of the objectives of the EPA, *the Hazardous Waste (Management and Handling) Rules were enacted in 1989*. It was felt that it was essential to have a dividing line between waste and by-artifact streams. These Rules were amended in the year 2000 primarily to bring them in line with the Basel Convention. The amendment made in the Rules in the year 2000 classified the waste by method of waste generation (**Schedule-I**) and as per their characteristics (**Schedule-II**). Classification of waste by method of waste generation covers the perilous wastes generated in the diverse industrial methods used and method variants. Thus, 44 categories were identified comprising 148 waste streams in **Schedule-I** and 79 types of wastes in **Schedule-II**. The amendment made in the Rules in the year 2003 streamlined the list of methods/ waste streams in **Schedule-I**. Thereby, the number of industrial methods generating perilous waste was reduced from 44 to 36 and the number of waste streams from 148 to 123. The **Schedule-II** was essentially left unaltered [6]. Bringing further amendments to the Hazardous

Wastes (Management and Handling) Rules, 1989, the draft amendment Rules, 2002 were notified as *The Hazardous Wastes (Management and Handling) Rules, 2003* on 20 May 2003. Since e-waste or its constituents fall under the category of perilous and non-perilous waste, they have been covered under its purview. As per the Rules, perilous waste is defined as any waste which by reason of any of its physical, chemical, reactive, noxious, flammable, explosive or corrosive characteristics causes danger or is probable to cause danger to health or environment, whether alone or when in contact with other wastes or compounds [7].

## **2. The Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules, 2008**

In its Endeavour to frame appropriate law for e-waste, the Central Government drafted the Hazardous Material (Management, Handling and Trans-boundary Movement) Rules, 2007 to prohibit cross-border movement of perilous waste as envisioned by the Basel Convention, to which India is a signatory. On 24 September 2008, these Rules were notified as the Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules,

2008 by the Ministry of Environment and Forests in supersession of the Hazardous Wastes (Management and Handling) Rules, 1989 except in respect of things done or omitted to be done before such supersession[8]. Supersession rules include directions for appropriate management and handling of perilous wastes together with electrical and electronic wastes. As per these Rules, every person desirous of remanufacturing or reprocessing perilous waste together with electronics and electrical waste is required to register with the Central Pollution Control Board. The units handling e-waste are required to register with the CPCB [9]. Under *the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008*, the Ministry of Environment and Forests is the nodal Ministry to deal with the cross-border movement of the perilous wastes and to grant permission for transit of the perilous wastes in the course of any part of India. It has placed trade-in of perilous waste items fewer than three categories i.e., compounds that can be trade-in with prior approval, free imports under Open General License and compounds which are prohibited for import in India. The first category includes metal and metal bearing wastes of antimony, lead, galvanic sludge and waste lead acid batteries whole or crushed. An importer is required to have a license from the Directorate General of Foreign Trade. The list in the second category comprises resources such as iron, steel,

zinc scrap, lead scrap except lead acid batteries waste of copper and its alloys. The wastes listed in this category are traded under Open General License. The third category prohibits trade-in of waste containing mercury, beryllium, arsenic, selenium, thallium, chromium compounds etc. as given in Schedule VI. Furthermore, the Ministry of Environment and Forests has constituted a Coordination Committee to oversee the execution of the Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules, 2008. The Committee consists of the representatives from *the Ministry of Finance (Department of Revenue), Ministry of Commerce and Industry (DGFT), Ministry of Shipping, CPCB and selected State Pollution Control Boards and experts.*

### **3. The E-waste (Management and Handling) Rules, 2011**

Considering it necessary in the public interest to enable the resurgence or reuse of useful material from e-waste, thereby reducing the perilous wastes destined for clearance, and to make sure the ecologically effective management of all types of waste electrical and electronic tool, the Government introduced the draft E-waste (Management and Handling) Rules, 2010 [10]. After inviting objections or suggestions from the stakeholders, the Ministry of Environment & Forests has finalized the draft modified e-waste (Management and Handling), Rules 2010 in September 2010 and put it on their website. These Rules have come into force with effect from 1 January 2012 and implemented in the course of the State Governments or State Pollution Control Boards. Meanwhile the Department related *Parliamentary Standing Committee* on Industry functioning under the jurisdiction of the Chairman, Rajya Sabha, has exclusively taken up the subject of electronic wastes and Medium, Small and Micro Enterprises (MSMEs). It has heard the Secretary, *MSME on the draft rules in its Meeting held on 20 December 2010*. It was felt by the Committee that the views of the MSME on the aforementioned rules are important as hefty numbers of medium enterprises are involved in the management and remanufacturing of e-waste. The committee envisaged all recommendations from MSME in its report and submitted. Finally, we got the much awaited specific law on e-waste in India so as to control e-waste problem and to provide for its disposal.

### **4. Criticism of the e-waste rules, 2011**

Even, the Rules on e-waste management framed by the Government have been criticized on several grounds by various ecological groups. First and foremost, it ignores the unorganized and small and medium sectors

where 90 percent of the e-waste is generated. The law currently does not facilitate for any plan to rehabilitate those involved in informal remanufacturing. The Electronics Industry Association of India (ELCINA) with the support of *the Department of Scientific and Industrial Research (DSIR)*, Ministry of Science & Technology, studied the status and impending of e-waste management in India in February 2009. Their findings proved that a symbiotic relationship between the formal and the informal segment was crucial. It said: “The informal segment’s role in assortment, segregation and dismantling of e-waste needs to be nurtured to complement the formal remanufacturers as supply chain partners. They should take on the higher know-how remanufacturing methods.”[11] The assortment and segregation and dismantling of e-waste is not perilous and the methods are efficiently carried out by the informal segment because mainly the e-waste can be refurbished and sold as second hand. The extraction of expensive metals is the perilous method, which should be left for the formal segment. Secondly, the Rules also do not detail the industry model for assortment of e-waste from end-users. The legislations enacted by the Government cover generation, storage, transportation and clearance of perilous waste except do not propose a streamlined assortment mechanism. Never the less, other nations on e-waste have sought the participation and involvement of manufacturers as they are best equipped to address the solutions to the complex composition of such goods [12].

##### **5. E-Waste (Management) Rules, 2016**

Looking to growing problems of e-waste, the Central Government in the exercise of the powers provided under Sections 6, 8 and 25 of the Environment (Protection) Act, 1986 has notified these rules. E-Waste (Management) Rules, 2016 supersede the E-Waste (Management and Handling) Rules, 2011. It consists of 24 rules divided in Six Chapters and four Schedules. The rules aims to enables the recovery and/or reuse of useful material from ewaste, thereby reducing the hazardous wastes destined for disposal and to ensure the environmentally sound management of all types of waste of electrical and electronic equipment. These rules shall come into force from 1st October, 2016. These rules shall apply to every Producer, Consumer and Bulk Consumer, Manufacturer, collection centers, dealers, e-retailer, re-furbisher, dismantler and recycler involved in the manufacture, sale, purchase and processing of electrical and electronic equipment, including their components, consumables, parts and spares which make the product operational but shall not apply to-

- a. Used lead acid batteries as covered under the Batteries (Management and Handling) Rules,2001made under the Act;
- b. Micro enterprises as defined in the Micro, Small and Medium Enterprises Development

Act, 2006 and c. Radio-active wastes as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and Rules made there under. Responsibilities under the Rule of 2016

### **I. Responsibility of Manufacturer.**

**A.** The manufacturer shall be responsible to collect e-waste generated during the manufacture of any electrical and electronic equipment and channelise it for recycling or disposal;

**B.** The manufacturer shall ensure that no damage is caused to the environment during storage and transportation of e-waste and also file annual returns to the concerned State Pollution Control board before the 30th June.

### **II. Responsibility of Producer**

**A.** The producer shall be responsible for the collection of e-waste generated from the „end of life“ of their products and channelizing it for recycling or disposal. And to ensure that such e-waste are channelized to registered dismantler or recycler.

**B.** The import of electrical and electronic equipment shall be allowed only to producers having Extended Producer Responsibility-Authorization and also filing annual returns to the Central Pollution Control Board on or before 30th June of the financial year.

**C.** The producer shall also be responsible for providing contact details such as address, telephone numbers/helpline numbers to consumer(s) or bulk consumer(s) so as to facilitate return on fused electrical and electronics equipment.

**D.** Further, the producer shall be responsible to create awareness among consumers or bulk consumers with regard to hazardous constituents, hazards of improper handling and improper recycling of e-waste and instructions for handling the equipment after its use along with do's and don'ts.

### **III. Responsibilities of Collection Centers**

The collection centers are responsible to collect e-waste on behalf of producer or dismantler or recycler or re-furbisher. The collection centre shall also ensure that e-waste collected by them is stored in a secured manner and no damage is caused to the environment during storage and transportation. The collection centre shall file annual return to State Pollution Control Board on or before the 30th day of June and also maintain the records of the e-waste.

#### **IV. Responsibilities of Dealers**

The dealer shall collect the e-waste by providing the consumer a box, bin or a demarcated area to deposit e-waste, or through take back system and send the e-waste so collected to collection centre or dismantler or recycler. The dealer or e-retailer shall refund the amount as per take back system to the depositor of e-waste; every dealer shall ensure that the e-waste thus generated is safely transported to authorized recyclers and no damage is caused to the environment during storage and transportation of e-waste.

#### **V. Others Responsibility**

- A. Of Re-furbisher
- B. Of Consumer
- C. Of Dismantler and etc.

#### **Policy Recommendations**

A major component of the initiative's activities is to provide technical expertise for Informed policy making at various levels. Recently, the initiative has been involved in suggesting models for the management of e-waste in India through A concept note. The main objective of this concept note is to create a consensus Amongst all the stakeholders in arriving at an acceptable and feasible solution for India. The aim is also to

raise issues that stimulate the necessary debate to fine-tune. The proposed models, paving the way towards a regulated and organized e-waste Management system in India.

### **Towards Sustainability:**

Presently the sustainability issues at the stages of product design or production mainly incorporated environmental sustainability and so fall short of social, economic and ethical sustainability. To have an e-waste management system which is environment friendly, the following aspects are to be taken into consideration:

- Remuneration for research and development in the areas of green design development and maintenance of ICT products.
- Incorporation of enforcement clauses in national regulations in a rational way considering the economic conditions of the society.
- Recognition of the importance of the life cycle assessment to have proper estimation on the generation of WEEE.
- Building up the confidence of civil society and consumers in the existing system of e-waste management through mass awareness.

With the broad definition of sustainability encompassing economic, social and environmental aspects, it is now necessary mainly for the developing nations, that the international standards/ policies/ guidelines should be adjusted considering the socioeconomic condition of a nation. Being in line with UNDP's millennium development goals, it is an important criterion for a green society to be socially and ethically sustainable.

### **Conclusion**

Management of solid waste is a huge task and has become more complex due to introduction of e-waste in Indian solid waste disposal system. the need for detailed assessment of the current and future scenario of e-waste generation and its disposal including the need for a proper management system including quantification, characteristics and existing disposal practices. With the increasing industrial activities, the need for maintaining a balance between economic growth and environment protection grows. There is an increased focus towards the concept of sustainable development, wherein, both the

objectives can be fulfilled simultaneously without hampering the other. Compliance with environmental norms also builds a better brand image of the organization. Apart from that, the rules and laws regarding the management of waste and protection of the environment have become more stringent. No laxity is accepted in the obligation of functioning in an environment friendly manner. If organizations do not follow the provided norms, their right to carry out business operations can also be revoked by the State. To avoid such sanctions, it is important that organizations approach the issue of environment protection and waste management in an efficient way, and help the society as a whole to develop in a manner, which is sustainable in the longer run.

### ***REFERENCES:-***

- ❖ 1. Wang, Y., Luo, C., Li, J., Yin, H., Li, X., Zhang, G., (2011). “Characterization of PBDEs in soils and vegetations near an e-waste recycling site in South China”. *Environmental Pollution*, p1-6.
- ❖ 2. Kohler, A., Erdmann, L., (2004). “Expected environmental impacts of pervasive computing”. *Human and Ecological Risk Assessment*, 10(5), p 831- 852.
- ❖ 3. Department of Parliamentary Standing Committee on Science & Technology, Environment & Forests, One Hundred and Ninety-second Report on “Functioning of Central Pollution Control Board”, Rajya Sabha Secretariat, New Delhi (Sept. 2008).
- ❖ 4. The Constitution of India, “XII Schedule”, Government of India, Ministry of law & Justice (2005) p.248
  
- ❖ The United Nations Conference on the Human Environment, also known as the Stockholm Conference was the UN’s first foremost conference on international ecological issues and marked a turning point in the development of international environment politics.
- ❖ Aditya Ecological Services Pvt. Ltd. (AESPL), Inventory of Perilous Wastes in Maharashtra, sponsored by Maharashtra Pollution Control Board (MPCB).
- ❖ “Hazardous Wastes (Management and Handling) Amendment Rules, 2003”, the Gazette of India Extraordinary, Part II, Section 3 Sub Section (ii), Published by Authority No. 471, New Delhi, Ministry of Environment and Forests Notification, New Delhi (May 20, 2003).

- ❖ <http://www.indiaenvironmentportal.org.in> (Visited on Feb. 25, 2015) .
- ❖ M.P. Ram Mohan, Iti Garg and Gayatri Kumar, “Regulating e-waste: a review of the international and Indian legal framework on e-waste, “ in Rakesh Johri, E-waste: Implications, Regulations and Management in India and Current Global Best Practices, TERI, The Energy and resources Institute (2008) p.170-71.
- ❖ “The draft E-waste (Management and Handling) Rules, 2010” (May 14, 2010) Government of India, Ministry of Environment and Forests.
- ❖ “Its underbelly: Tricks of the e-waste trade”, Down to Earth, vol.19, no.1 (May 1631, 2010); DSIR Annual report 2009-2010; “Latest study identifies India’s e-waste impending”, Remanufacturing International (Mar. 17, 009).
- ❖ P. Srisudha, “Tackling e-waste”, The Hindu (Jun. 28, 2009).