Digital India
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Ministry of Electronics
and Information Technology
Government of India

E-Waste Awareness for Dealers

Manual for Training of Trainers

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1. About the Project

The Ministry of Electronics and Information Technology (MeitY) has initiated the project “Awareness Programme on Environmental Hazards of Electronic waste” on March 31, 2015. This project is under the ‘Digital India’ initiative of the Government of India. The project is expected to have far reaching and significant impact on the growth of the country as it focuses on reuse and recycling of e-waste, which has the potential to conserve natural resources. The project has three components viz., Content Development, Inventory Assessment and Awareness Generation amongst different stakeholders. The project will help in effective implementation of E-waste (Management) Rules, 2016.

The primary focus of the project is to create awareness among different stakeholders in order to reduce the adverse impact on environment and health due to improper disposal of e-waste. MeitY has played a key role in dissemination of knowledge on e-waste rules in the past and wishes to engage all key stakeholders during this exercise. During the project duration of 5 years, a city in each of the 10 identified states viz. Madhya Pradesh, Uttar Pradesh, Jharkhand, Orissa, Goa, Bihar, Pondicherry, West Bengal, Assam and Manipur has be covered in phase I. in phase II, the same has been enhanced to covered more than 30 cities across 30 states and union territories in India. The activities include organising awareness workshops for RWAs/Localities, Schools, Colleges, Bulk Consumers (including corporate & Govt. sectors), Informal Sector, Dealers, Refurbishers, Manufacturers, etc. so as to build capacities of the target groups to channelize e-waste in a manner that the rules are effectively implemented. Suitable course curriculum has also be framed for schools/colleges. Effort would be made to prepare the content in local language.

This project has also stressed on adopting best practices for e-waste recycling available globally, so that the unorganised sector can generate jobs as well as viable business prospects thereby mitigating the impact of improper recycling on the environment. Recycling of e-waste will help in creating jobs and recovery of valuable components and materials through dismantling. The valuable metals recycled from old electronic items can also be used in manufacturing of new products. As a result, this will save energy, reduce pollution, mitigate greenhouse gas emissions, and reduce extraction of finite natural resources through mining. The project will also emphasize on the responsibilities of the producers and convey the message that they must inculcate the principle of Extended Producer Responsibility (EPR) and follow the mechanism for channelisation of e-waste from ‘end of life’ products to registered dismantlers or recyclers.

The tools and dissemination material for creating awareness are developed by MAIT to create awareness among various stakeholders in the value chain. The awareness workshops will help to present the current situation on e-waste disposal and practices thereby creating awareness on the issue; its recycling as well as the legal provisions and the responsibilities of the stakeholders.

The program has been able to enhance its reach to cities across each state during the course of 5 years of its implementation. This will help to inculcate better disposal practices amongst all stakeholders thereby reducing the environmental impacts of improper handling and recycling of e-waste.

2.Framework of the Manual

The objectives of the manual are the following:

To act as a tool for enhancing the understanding of the trainers who would be involved in conducting the training of representatives of manufacturers on the subject of e-waste.

To serve as a ready reference for trainers to design and organize trainings on the subject of e-waste for manufacturers.

To serve as a compilation of information on the following issues related to the subject of e-waste:
• What are the categories of e-waste?
• What is the generation of E-waste globally and in India?
• What are the hazardous substances in E-waste?
• What are labelling mechanisms in electronics?
• The E-waste (Management) Rules, 2016 and the challenges of implementing the Rules.
• What are the responsibilities of the manufacturers within the e-waste management rules, 2016 (s)
• What are the building blocks to an internal policy on e-waste management.
• Guidelines for setting up of collection centres of e-waste.
• How do you set up of a PRO for collecting e-waste
• How can you do awareness on e-waste with all stakeholders
• How can you work with the informal sector for e-waste collection
• How to make EPR plans
• How do you finance EPR in the Indian context?

To serve as a guide for implementing initiatives by manufacturers that contribute to safe e-waste management in India.

Objectives of the training of trainers:

The training of trainers has been designed with the objective to enhance the understanding on the subject of e-waste amongst manufacturers. This will be achieved by a training of trainers on the subject of e-waste and providing them with adequate tools to organize trainings for manufacturers.

The training of trainers will be followed by trainings for manufacturers so that they can contribute to effective handling and management of e-waste.

The training provided will increase knowledge amongst manufacturers about the generation of e-waste, hazardous substances in e-waste, present status of generation and disposal in India, regulation on management and handling of e-waste in India, role of manufacturers as producers and efforts like setting up of e-waste collection centres that can be undertaken by them. In addition they will be introduced to responsibilities under the e-waste management rules, 2016, guidelines for setting up of PRO and collection mechanisms and how to meet the challenges in implementing the e-waste management rules, 2016.

The manual uses different methods to achieve the change objective including the Donna E. Walker's 'Learning Cycle' that has five steps including Mind Jog, Personal Connection, Information Exchange, Information Application and Real World Connection. This method takes into account that different learners have different learning abilities and at least one of the steps of the cycle would be able to transfer the learning effectively.

The manual provides essential information and situations that form cases that can be discussed with the manufacturers by the trainer.

How to use the manual:

This manual has 2 major components to it with of the objective of providing experiential learning to its users.

Component 1 is on the learning cycle which has been adopted from the finest techniques available for experiential learning today. The sessions help to unpack the subject at hand and enable to gain a better understanding of solutions in order to solve the problem. It also ensures that engagement is built with participants so that the training sessions are not just monologues from the trainer to the participants but allows the space for dialogue in order to enhance understanding of the subject of implementing the e-waste management rules, 2016.

Component 2 includes references which have been extensively researched from material available through secondary sources. This includes work which has been done in India as well as around the world and has been published in renowned journals and publications. The links to the material have also been provided so that interested readers can enhance their understanding.

In order to use the manual, the trainer has to go through the reference material in order to read in detail about the different issues that are discussed. For each session as elaborated, the trainers will discuss the subject at length in the time provided in order to ensure that their understanding is enhanced and they can pass the message to the relevant stakeholders during training workshops and activities that they are a part of during the course of the project.

3.References:

a)What are the categories of e-waste?

Waste Electrical and Electronic Equipment (WEEE) also referred to as UEEE (Used Electrical and Electronic Equipment), e-waste, or e-scrap is a generic term used to cover all items of electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intend of reuse. more or less precise definitions can be found throughout the world. For instance, according to the WEEE Directive 2012/19/EC (European Union) WEEE are defined as a category of waste, consisting of equipment at the end-of-life, powered by electricity or through electro-magnetic fields and designed for use in a voltage typically not exceeding the !)V AC and 1500V AC. They are presently divided into the ten following categories;

1. Large household appliances
2. Small household appliances
3. Information technology and telecommunications equipment
4. Consumer equipment
5. Lighting equipment
6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools)
7. Toys, leisure and sports equipment
8. Medical devices (with the exception of all implanted and infected products)
9. Monitoring and control instruments
10. Automatic dispensers

However, these ten categories will be regrouped into the six following categories by 2018;

1. Temperature exchange equipment (refrigerators, freezers, air conditioning equipment, etc)
2. Screens, monitors and equipment containing screen having a surface greater that 100 cm^2 (screens, televisions, LCD, photo frames, monitors, laptops, notebooks)
3. Lamps (fluorescent lamps, sodium lamps, LED, etc)
4. Large equipment, that is, any external dimension more than 50 cm (washing machines, dish washing, cookers, copying equipment, photo voltaic panels, etc)
5. Small equipment, that is, no external dimesnsion more than 50 cm (vaccum cleaners, caper sweepers, Hi-fi equipment, musical equipment, etc)
6. Small information technology and telecommunication equipment (mobile phones, GPS, project calculators, routers, personal computers, printers, telephones)

Composition of e-waste:

The composition of e-waste is very diverse and contains products across different categories. A typical electronic and electrical item consists of more than 1000 different substances which can fall under hazardous and non-hazardous categories. The major constituents are ferrous and non-ferrous metals, plastics, glass and plywood, printed circuit boards, concrete and ceramics, rubber and other items. Iron and steel constitutes about 50% of the WEEE followed by plastics (21%), non-ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals like silver, gold, platinum, palladium etc.

Pollutant/ Element	Occurrence
Arsenic	Semiconductors, diodes, microwaves, LEDs (light emitting diodes), solar cells
Barium	Electron tubes, filler for plastic and rubber, lubricant additives
Brominated flame –proofing agent	Casing, circuit boards (plastic), cables and PVC cables
Cadmium	Batteries, pigments solder, alloys, circuit boards, computer batteries, monitor cathode ray tubes (CRTs)
Chrome	Dyes/pigments, switches, solar
Cobalt	Insulators
Copper	Conducted in cables, copper ribbons, coils, circuitry, pigment
Lead	Lead rechargeable batteries, solar, transistors, lithium batteries PVC(polyvinyl chloride) Stabilizers, lasers, LEDs, thermoelectric elements, circuit boards
Liquid crystal	Displays
Lithium	Mobile telephones, photographic equipment, video equipment (batteries)
Mercury	Components in copper machines and steam irons; batteries in clocks and pocket calculators, switches, LCDs
Nickel	Alloys, batteries, relays, semiconductors, pigments
PCBs (Polychlorinated biphenyls)	Transformers, capacitors, softening agent for paint, glue plastic
Selenium	Photoelectric cells, pigments, photocopiers, fax machine
Silver	Capacitors, switches (contacts), batteries, resistors
Zinc	Steel, brass, alloys, disposable and rechargeable batteries, luminous substances.

Table 1: Pollutants and their occurrence in e-waste
Source: Rajya Sabha Secretariat, 2011

Table 2: Possible Hazardous substances in e-waste components (CPCB, 2008)

Hazardous Substance	Danger
Lead	A neurotoxin that affects the kidneys and the reproductive system, high quantities can be fatal. It affects mental development in children. Mechanical breaking of CRTs (cathode ray tubes) and removing solder form microchips release lead as powder and fumes.
Plastic	Found in circuit boards, cabinets and cables, they contain carcinogens.

	BFRs or Brominated flame retardants give out carcinogenic Brominated dioxins and furans Dioxins can harm reproductive and immune systems. Burning PVC, a component of plastics, also produces dioxins BFR can leach into landfills Even the dust on computer cabinets contains BFR.
Chromium	Used to protect metal housings and plates in a computer from corrosion, inhaling Hexavalent chromium or chromium 6 can damage liver and kidney and cause bronchial maladies including asthmatic bronchitis and lung cancer.
Mercury	Affect the central nervous system, kidneys and immune system. It impairs foetus growth and harms infants through mother's milk. It is released while breaking and burning of circuit boards and switches mercury in water bodies can form methylated mercury through microbial activity. Methylated mercury is toxic and can enter the human food chain through aquatic.
Beryllium	Found in switch boards and printed circuit boards. It is carcinogenic and causes lung diseases.
Cadmium	A carcinogen. Long-term exposure causes Itai-Itai disease, which causes severe pain in the joints and spine. It affects the kidneys and softens bones. Cadmium is released into the environment as powder while crushing and milling of plastics, CRTs and circuit boards. Cadmium may be released with dust, entering surface water and groundwater.
Acid	Sulphuric and hydrochloric acids are used to separate metals from circuit board's furnes contain chlorine and sulphur dioxide, which cause respiratory problems. They are corrosive to the eye and skin.
PBB	Polyhalogenated derivatives which can cause pre and post natal complications and can lead girls to menarche at an early age. They can also cause acne.
PBDE	Leads to restriction in development of kids between the age of 1 and 6 years.

E-Waste Source	**E-Waste Component**	**Environmental Hazard**	**Effects on Human**
CRTs (used in TVs, Monitors, ATM, Video Camera, etc), Batteries, PVC cables, Paints	Lead, barium & other heavy metals	These metals leaching g into the ground water and release of toxic phosphor	Anemia, Renal Toxicity, Insominia
Batteries, Housing & Medical equipment	Mercury	Air emissions as well as discharge into rivers of glass dust	Renal Toxicity, Muscle Tumors, Mental retardation cerebral palsy
Plastics from printers, keyboards, monitors etc	Plasticizer bisephenol-A(or BPA) as well DEHP and DBP Plastic compound known as phthalates	Chlorinated plastic release harmful chemicals into the surrounding soil, which seep into ground water or other surrounding water sources which cause serious harm to the species that drink this water.	Risk in developing heart problems, obesity reproductive disease
PVC & Polymer, Paints, Printing inks, electrical transformers & Capacitors	Polychlorinated Biphenyls (PCBs)	Include extreme pollution from production, toxic chemical exposure during use, hazards form fires	Suppression of immune system damage to the liver nervous and reproductive systems

Table 3: Possible hazardous substances in WEEE/E-waste components

Table 4:Component and possible hazardous content

Component	Possible Hazardous Content
Metal	
Motor/compressor	
Cooling	Ozone Depleting Substances (ODS)
Plastic	Phthalate plasticize, BFR
Insulation	Insulation ODS in foam, Asbestos, refractory ceramic fiber
Glass	
CRT	Lead, antimony, mercury, phosphors
LCD	Mercury
Rubber	Phthalate plasticizer, BFR
Winning/electrical	Phthalate plasticizer, lead , BFR
Concrete	
Transformer	
Circuit Board	Lead Beryllium , antimony, BFR
Fluorescent Lamp	Mercury, Phosphorus, Flame retardants
Incandescent Lamp	
Healing element	
Thermostat	Mercury
BFR – containing plastic	BFRs
Batteries	Lead, lithium, Cadmium, Mercury
CFC, HCFC , HFC , HC	Ozone depleting substances
External electric cables	BFRs, plasticizers
Electrolyte capacitors (over L/D 25mm)	Glycol, other unknown substances

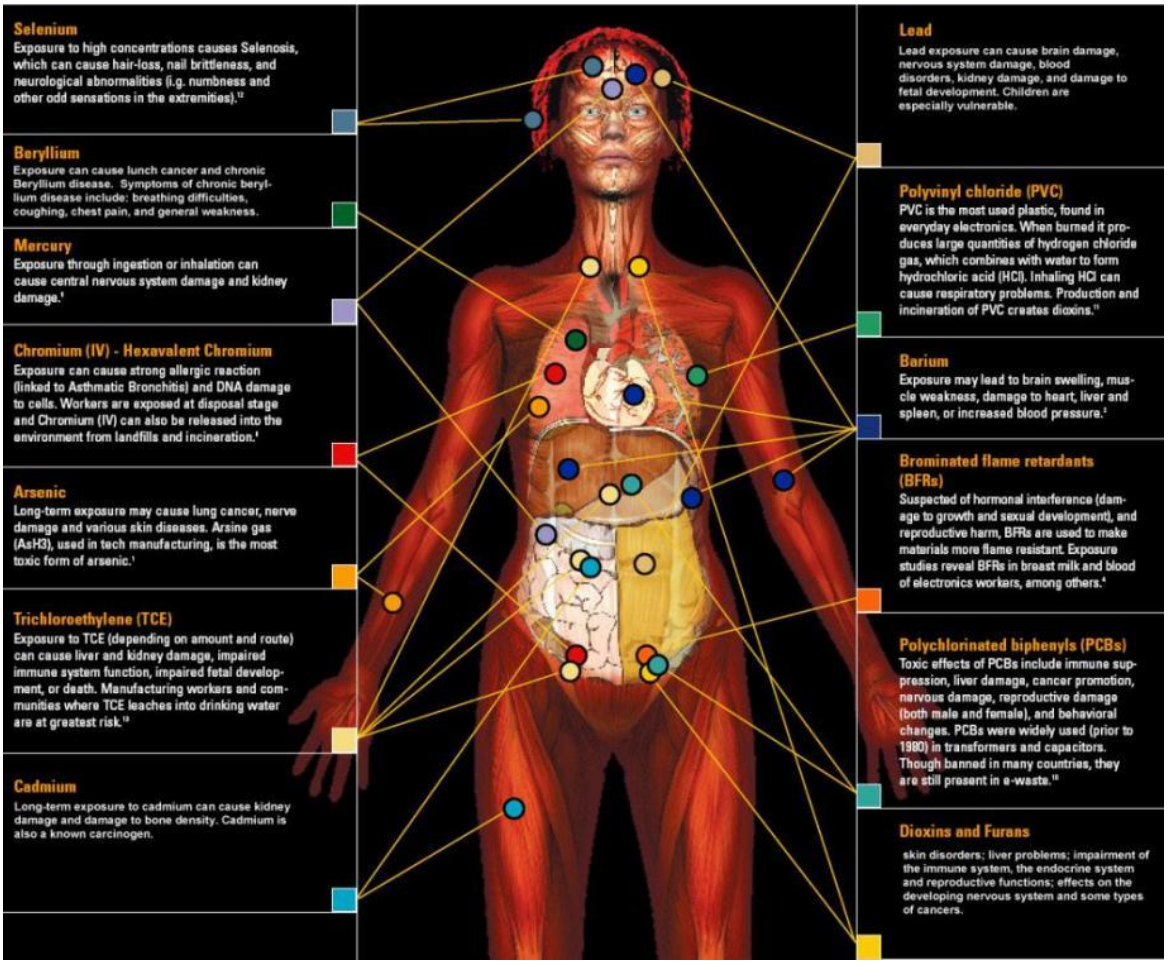


Figure 1: Adverse Impact of e-waste

Source:
http://www.capeewaste.co.za/why_recycle_ewaste.html

Exposure to e-waste may lead to changes in thyroid function, changes in cellular expression and function, adverse neonatal outcomes, changes in temperament and behaviour, and decreased lung function. Boys aged 8–9 years living in an e-waste recycling town had a lower forced vital capacity than did those living in a control town. Significant negative correlations between blood chromium concentrations and forced vital capacity in children aged 11 and 13 years were also reported. Findings from most studies showed increases in spontaneous abortions, stillbirths, and premature births, and reduced birthweights and birth lengths associated with exposure to e-waste. People living in e-waste recycling towns or working in e-waste recycling had evidence of greater DNA damage than did those living in control towns.

b)What is the generation of e-waste in India and globally

WEEE belongs to the fastest growing waste stream in the world, with an increase from 33.8 million metric tonnes (Mt) in 2010 to 41.8 Mt in 2014 and by 2016, the world generated 44.7 million metric tonnes (Mt) of e-waste and only 20% was recycled through appropriate channels.. The main driving forces of such a trend are explained by,

- The increase of the world population 9from July 2010 to July 2015, the world population has increased from 6.92 billion to 7.32 billion, with a possible extrapolation at 10.8 billion by 2100)
- The rapid socio-economic development including reinforced urbanization with facilitated access to modern technologies (in 2014 the WEEE generated per capita ranged from 0.2 kg per inhabitant in low income countries such as Burundi, Democratic Republic of Congo, etc up to 28.3 kg per inhabitant in Norway
- The change in consumer patterns 9eg, in March 2014 there was still nearly twice the percentage of desktop only internet users as mobile only users in USA, while the number of mobile only internet users in March 2015 exceeded that of desktop only internet users)
- The rapid technological advancement 9most US consumers used to upgrade their mobile phones after about 2 years)

Various correlations can be plotted between the total amount of WEEE generated worldwide and parameters representative of the society's evolution.

From the aforementioned considerations, it is clear that the world WEEE stream is expected to significantly increase in the next few decades. Considering that the WEEE contains an average about 2.2% (by weight) of Printed Circuit Boards (PCBs), 4.6% of mineral fraction, 9.2% of residues from grinding, 44.7% of ferrous metals, 7.5% of non-ferrous metals, 18.3% of plastics, 12.2% of glass and 1.3% of other type of materials, there are three main reasons for their processing; environmental concerns 9the total WEEE generated in 2014 is the equivalent of about 5700 Eiffel towers (in weight) and contains hazardous chemicals), energy savings and resource efficiency via recycling of valuable materials (the intrinsic material value of global e-waste was estimated to be 48 billion euro in 2014). Thus it is of -particular importance to organize/optimize the management of the end-of-life of EEE. For this goal a circular economy is being progressively developed worldwide to reduce as much as possible the volume of ultimate waste, to prevent any environmental concern (landfilling is still a common practice in some countries) and to contribute to material resources recycling. Basically, a typical circular economy scheme should include end-of-life EEE/collection, WEEE treatment and material recycling, resale of recycled materials on the market, manufacturing/eco-conception, and commercialization of new EEE or other devices.

In reality the circular economy scheme is theoretical in nature as the situations are so much contrasted around the world. Indeed, official take back legislation is organised in a limited number of countries (mostly European countries) and covers only about 4 billion people (about 575 of the world population) so that only 6.5 Mt of the 41.8 Mt of WEEE generated in 2014 were documented and recycled with the highest standards.

The global efficiency of the circular economy value chain is not purely technical in nature. The societal aspects are also important.

E-waste releases pollutants in air, water and soil that have very adverse impacts on environment and health. For instance, heavy metals are released through dust generated during mechanical treatment, for example, the dismantling and crushing of e-waste. In addition metals are released during vaporization wherein metals are released from compounds in an acid bath. Dioxins and furans are released in flue gases during thermal treatment like incineration. The combustion of cable insulation containing PVC in order to recycle copper wiring and the incineration of epoxy resin containing flame retardant from circuit boards in order to recycle the metal they contain also released dioxins and furans. Acids are released in the form of vapour when metals are released from compounds. Acids may also get distributed throughout the surrounding area in the following ways factory air and dust being blown into the vicinity, leaching through waste water and seepage and release of flue gas into the atmosphere as a result of open incineration of furnace combustion. Therefore, environmentally sound management of e-waste can have several benefits for health of human beings as well as improve the environmental quality in cities where informal recycling takes place.

c)What is e-waste

Electronic waste or e-waste:

'e-waste' means waste electrical and electronic equipment whole or in part or rejects from their manufacturing, refurbishment and repair process which are intended to be discarded as waste.

Source:
Indian Ministry of Environment and Forests & Climate Change 2016. E-waste (Management) Rules, 2016.

https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9SdWxlc18yMDE2LnBkZg==

https://cpcb.nic.in/uploads/Projects/E-Waste/e-waste_amendment_notification_06.04.2018.pdfCentral Pollution Control Board (CPCB)
http://cpcb.nic.in/

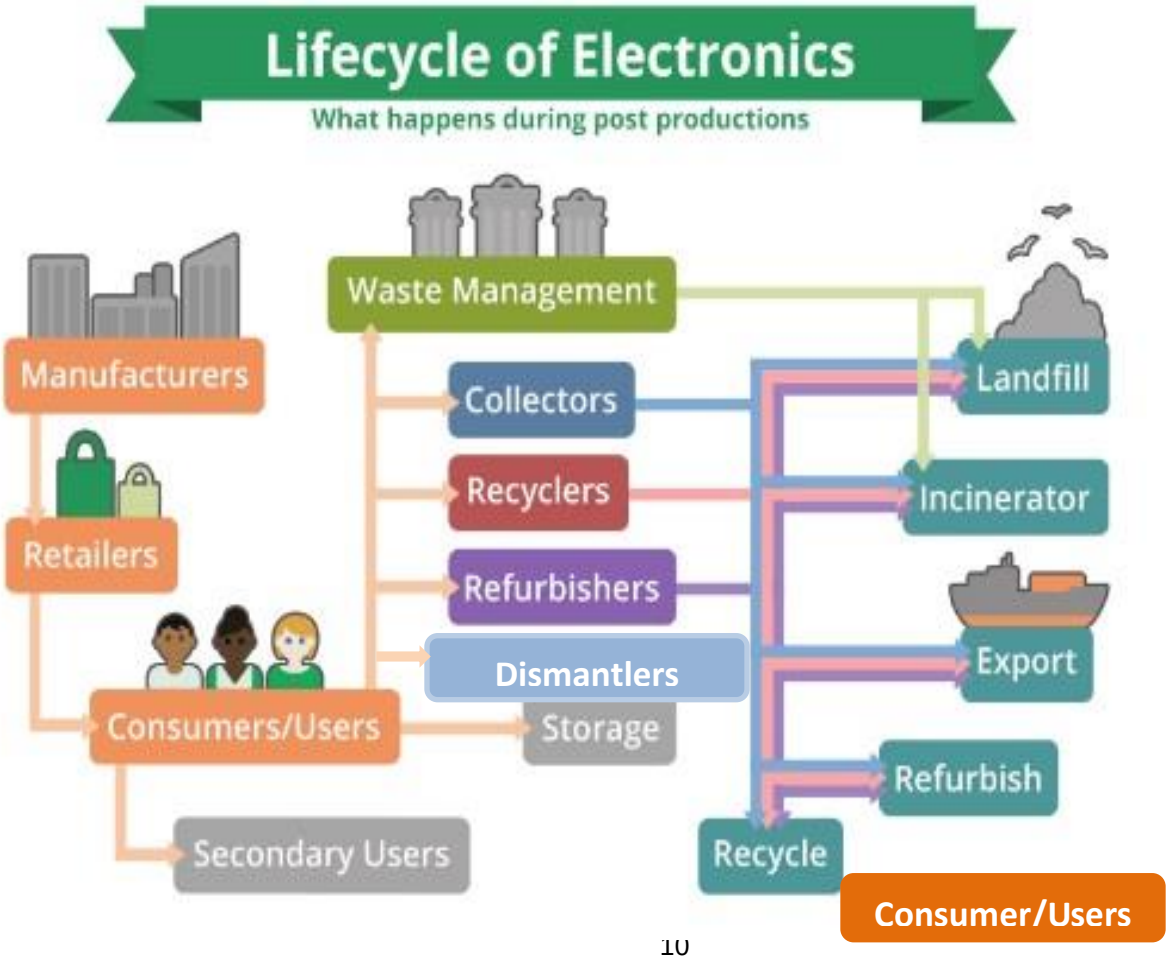


Figure 2: Lifecycle of electronics

Source:
http://greatforest.com/sustainability101/uncategorized/e-waste-recycled-video/)

India plays an important role in the domestic generation of e-waste (2 Mt in 2016) due to the large population

Around 2 million tonnes of e-waste is generated in India in 2016 (Global E-waste monitor, 2017)The main sources of electronic waste in India are the government, public and private (industrial) sectors, which account for almost 70 per cent of total waste generation. The contribution of individual households is relatively small at about 15 per cent; the rest being contributed by manufacturers. Though individual households are not large contributors to waste generated by computers, they consume large quantities of consumer durables and are, therefore, potential creators of waste. An Indian market Research Bureau (IMRB) survey of 'E-waste generation at Source' in 2009 found that out of the total e-waste volume in India, televisions and desktops including servers comprised 68 per cent and 27 per cent respectively. Imports and mobile phones comprised of 2 per cent and 1 per cent respectively (Rajya Sabha Secretariat 2011). In countries like China and India, though annual generation per capita is less than 1 kg, it is growing at an exponential pace. The increasing "market penetration" in developing countries, "replacement market" in developed countries and "high obsolescence rate" make WEEE/E-waste one of the fastest waste streams. Main contributors of e-waste includes It includes computer and its accessories, monitors, printers, keyboards, central processing units; typewriters, mobile phones and chargers, remotes, compact discs, headphones, batteries, LCD/Plasma TVs, air conditioners, refrigerators and other household appliances (Rajya Sabha Secretariat 2011).

Source:

https://collections.unu.edu/eserv/UNU:6341/Global-E-waste_Monitor_2017__electronic_single_pages_.pdf
WEEE Recycle & CSE. E-Waste Training Course for Policymakers and Regulators – Facilitator's Manual, http://greene.gov.in/wp-content/uploads/2019/08/2019082625.pdf
Rajya Sabha Secretariat 2011: E-waste in India. New Delhi. http://rajyasabha.nic.in/rsnew/publication_electronic/E-Waste_in_india.pdf

Amount of e-waste and recycling

The increased use of electrical and electronic equipment (EEE) and their high rate of obsolescence is leading to around 44.7 million tons of e-waste generation globally in 2016 and only 20% was recycled through appropriate channel. From the developed countries around 75% to 80% of e-waste is shipped to countries in Asia and Africa for "recycling" and disposal where majority of imported e-waste is managed through informal unsafe recycling channels (Perkins et al., (2014): 287).

Around 2 million tonnes of e-waste is generated in India (Global E-waste Monitor) According to Central Pollution Control Board (CPCB) (2019) list of registered e-waste dismantler/recycler in the country as on 27-06-2019 the total recycling capacity is 782080.62MTA.
For example, around 170,000 tons of electronic waste is generated from scrapped television alone in India every year. If each ton has a value of INR 10,000 then the recycling industry turnover would be INR 170 Crores. The total market is worth INR 1700 Crores despite considering a conservative value of e-waste.

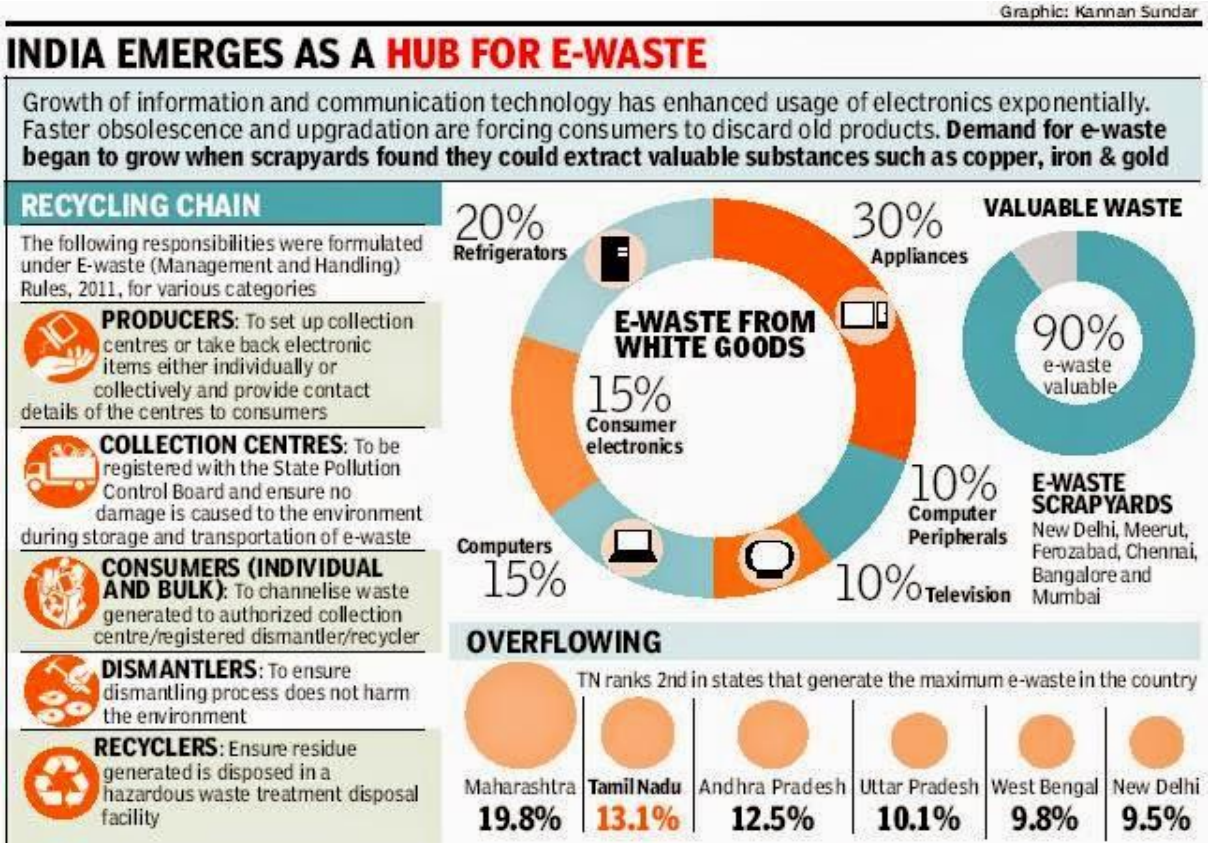


Figure 3: e-waste generation in India

The e-waste recycling sector revenue in 2015 was estimated at Euro 2.5 billion and is expected to grow to 3.5 billion by 2020 (Cucchiella et al., (2015)).

Source:

Central Pollution Control Board (CPCB) (2019), List of e-waste recyclers in India, https://cpcb.nic.in/uploads/Projects/E-Waste/List_of_E-waste_Recycler.pdf

Cucchiella, Federica, D'Adamo, Idiano, Koh, S.C. Lenny, Rosa, Paolo, (2015), Recycling of WEEEs: An economic assessment of present and future e-waste streams, Renewable and Sustainable Energy Reviews, Volume 51, November 2015, Pages. 263-272.

Figure 4: e-waste generation across the world

d)What are the resources embedded in e-waste

Resources embedded in e-waste:

The composition of e-waste is very diverse and contains products across different categories. A typical electronic and electrical item consists of more than 1000 different substances which can fall under hazardous and non-hazardous categories. The major constituents are ferrous and non-ferrous metals, plastics, glass and plywood, printed circuit boards, concrete and ceramics, rubber and other items. Iron and steel constitutes about 50% of the WEEE followed by plastics (21%), non-ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals like silver, gold, platinum, palladium etc.

e)How can you organize a collection drive for e-waste in your RWA/ locality? Which agencies can support you in organizing such a collection and awareness drive?

A collection drive for e-waste can be organized by contacting manufacturer or dealers who would then refer to the authorized collector, dismantler and recycler of e-waste. A record of each item collected in the drive should be maintained and provided to the collector, dismantler and recycler. The local pollution control board officer can be informed about the drive and the e-waste collected during the drive so that they can audit if safe recycling of the collected e-waste has been conducted.

All manufacturers, dealers and government's environment department could support collection and awareness drive. In addition national, international and local environmental NGOs can be partners for such a drive.

f)What is a carbon footprint?

Carbon Footprint

The total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO_2). In other words: When you drive a car, the engine burns fuel which creates a certain amount of CO_2, depending on its fuel consumption and the driving distance. (CO_2 is the chemical symbol for carbon dioxide). When you heat your house with oil, gas or coal, then you also generate CO_2. Even if you heat your house with electricity, the generation of the electrical power may also have emitted a certain amount of CO_2. When you buy food and goods, the production of the food and goods also emitted some quantities of CO_2 (TFC (2016)).

Source:

Time for Change (TFC), (2016), Definition of Carbon Footprint,
http://timeforchange.org/what-is-a-carbon-footprint-definition

Fee Online Tool to calculate Carbon Footprint:
http://www.nature.org/greenliving/carboncalculator/

g)What are the policies for e-waste management in our country?

As per the E-Waste (Management) Rules 2016 all e-waste should be recycled by authorized recyclers and dismantlers. In line with the principle of 'Extended Producer Responsibility' (EPR) the producers have to set up

a scheme for collection of used/waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier through dealers. In addition collection centres, Producer Responsibility Organisation, buy-back arrangement, exchange scheme, Deposit Refund Scheme, etc. should be implemented whether directly or through any authorised agency for channelising the items so collected to authorised recyclers. Consumers or bulk consumers of electrical and electronic equipment listed in Schedule I of the E-waste rules 2016[1] shall ensure that e-waste generated by them is channelised through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler; (2) bulk consumers of electrical and electronic equipment listed in Schedule I shall maintain records of e-waste generated by them in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board; As responsible consumers we are expected to deposit the e-waste at authorized collection centres.

Environmentally sound E-waste treatment technologies are used at three levels as described below:
- 1st level treatment
- 2nd level treatment
- 3rd level treatment

All the three levels of e-waste treatment are based on material flow. Each level treatment consists of unit operations, where e-waste is treated and output of 1st level treatment serves as input to 2nd level treatment. After the third level treatment, the residues are disposed of either in TSDF (Treatment, Storage, and Disposal Facility) or incinerated. The efficiency of operations at first and second level determines the quantity of residues going to TSDF or incineration. The simplified version of all the three treatments is shown below.

For non CRT E-waste, the major e-waste treatment facilities in India use the following technologies.

1. Dismantling 2. Pulverization/ Hammering 3. Shredding 4. Density separation using water

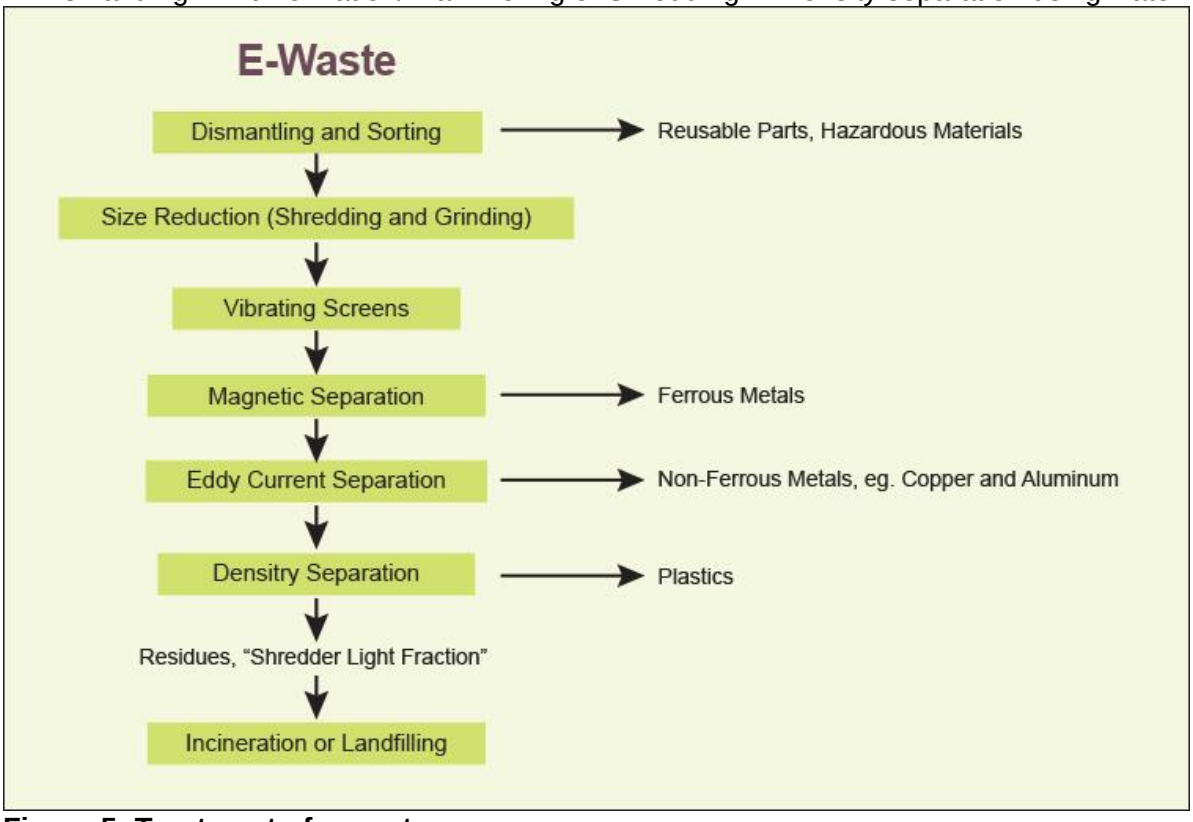


Figure 5: Treatment of e-waste

Source:

[1] '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 organisations, international agencies, partnership and public or private companies that are registered under the Factories Act, 1948 (63 of 1948) and the Companies Act, 2013 (18 of 2013) and health care facilities which have turnover of more than one crore or have more than twenty employees;

content/uploads/2019/08/2019082625.pdf

Indian Ministry of Environment and Forests & Climate Change 2016. E-waste (Management) Rules, 2016. https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9SdWxlc18yMDE2LnBkZg==

https://cpcb.nic.in/uploads/Projects/E-Waste/e-waste_amendment_notification_06.04.2018.pdfCentral Pollution Control Board (CPCB)
http://cpcb.nic.in/

E-waste Management Rules and its requirement for e-waste disposal and recycling

The E-waste Management Rules ask for 'environmentally sound management of e-waste' that 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 substances contained in such waste. The rules are applicable on producers, manufacturers, dealers, consumer, bulk-consumer, refurbishers and recyclers. It includes the following provisions to help ensure proper recycling and disposal of e-waste:

Implementation of Extended Producer Responsibility' (EPR) that puts responsibility on any producer of electrical or electronic equipment, for their products beyond manufacturing until environmentally sound management of their end-of-life products. 'Extended Producer Responsibility' means responsibility of any producer of electrical or electronic equipment, for channelisation of e-waste to ensure environmentally sound management of such waste. Extended Producer Responsibility may comprise of implementing take back system or setting up of collection centres or both and having agreed arrangements with authorised dismantler or recycler either individually or collectively through a Producer Responsibility Organisation recognised by producer or producers in their Extended Producer Responsibility - Authorisation;

Setting up 'Producer Responsibility Organisation' has been mandated that is a professional organisation authorised or financed collectively or individually by producers, which can take the responsibility for collection and channelisation of e-waste generated from the 'end-of-life' of their products to ensure environmentally sound management of such e-waste;

Implementation of Deposit Refund Scheme whereby the producer charges an additional amount as a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of life electrical and electronic equipment is returned;

Every producer of electrical and electronic equipment and their components or consumables or parts or spares shall ensure that, new Electrical and Electronic Equipment and their components or consumables or parts or spares do not contain Lead, Mercury, Cadmium, Hexavalent Chromium, polybrominated biphenyls and polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers and of 0.01% by weight in homogenous materials for cadmium.

Overall the rules ask for record keeping by all stakeholders except individual consumers who are expected to ensure that e-waste generated by them is channelized through safe recycling and disposal system as set up according to the rules.

Source:

Indian Ministry of Environment and Forests & Climate Change 2016. E-waste (Management) Rules, 2016. https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9SdWxlc18yMDE2LnBkZg==

h) Who can support the setting up of collection points for low-value e-waste?

Setting up a collection center for e-waste:

As per the e-waste management rules to set up a collection center there is a need to apply for authorization from the State Pollution Control Board or Pollution Control Committee as per FORM – 1(a). There is a need to have agreements with producers who are willing to get the e-waste covered under their EPR collected at your center as well as with dismantlers and recyclers who will be taking the e-waste from the collection center for further processing. It should be ensured that systems for record keeping and training for safe handling and storage of e-waste is provided to the people who will be managing the collection center.

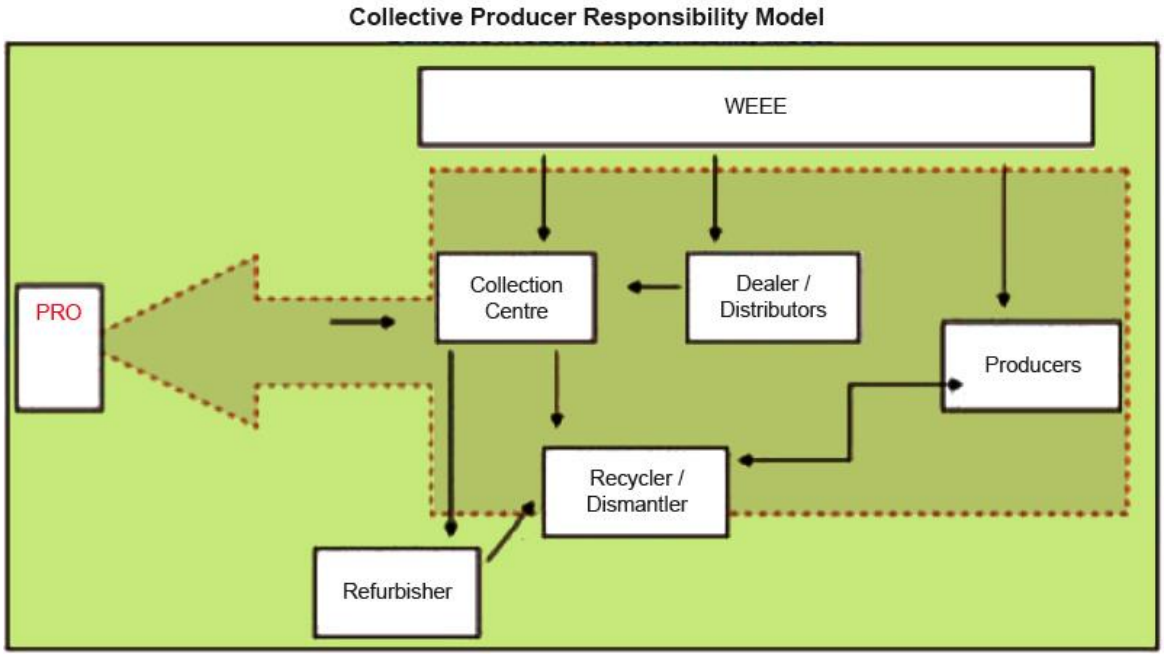


Figure 6: Collective Producer Responsibility Model representation with role of collection center

Responsibilities of Collection Centers include:

(1) Ensure that the facilities are in accordance with the standards or guidelines prescribed by the Central Pollution Control Board from time to time;

(2) The e-waste collected by them is stored in a secured manner till it is sent to registered dismantler or recycler as the case may be;

(3) Ensure that no damage is caused to the environment during storage and transportation of e-waste;

(4) Maintain records of the e-waste handled in Form 2 and make such records available for scrutiny by the State Pollution Control Board or the Pollution Control Committee concerned.

Precautions for setting up and managing such collection points

As precaution for setting up and managing collection points it is crucial to have Personal Protective Equipment (PPE) and Standard Operating Procedures (SOPs) for people handling e-waste. Record of the type of waste collected and time of collection should be maintained as per the E-waste management rules. Contract with recyclers and manufacturers should be in place to ensure that e-waste is managed safely after reaching the collection point.

How and where can you get information on the locally available collection services for e-waste

All manufacturers, producers and dealers should provide information about locally available collection, dismantling and recycling services through their web platforms, outlets. The information should also be available at the SPCB web platforms. Regular awareness campaigns and advertisements should be organized for providing information about locally available collection, dismantling and recycling services.

i)Resource consumption and Lifestyles of Health and Sustainability (LOHAS)

Resource Consumption:

It is an umbrella term for the many different ways and rates that humans consume the products of the natural world. Some resources are finite, meaning that once they are used there are none left, such as fossil fuels and land. Other resources are renewable, such as wind and solar energy.

Resource can be categorized into renewable and non-renewable, Renewable materials are not finite in availability as they can be replenished in a short duration for example agricultural products, livestock etc. While non-renewable resources are those that cannot be replenished or made again in short duration and may take billions of years to be made again for example fossil fuels that provide energy, metal ores used in the manufacture of cars and computers etc (FOE, 2005).

Due to the finite nature of fossil fuels and metals it is likely that we will runout of these resources in future as highlighted in the chart below:

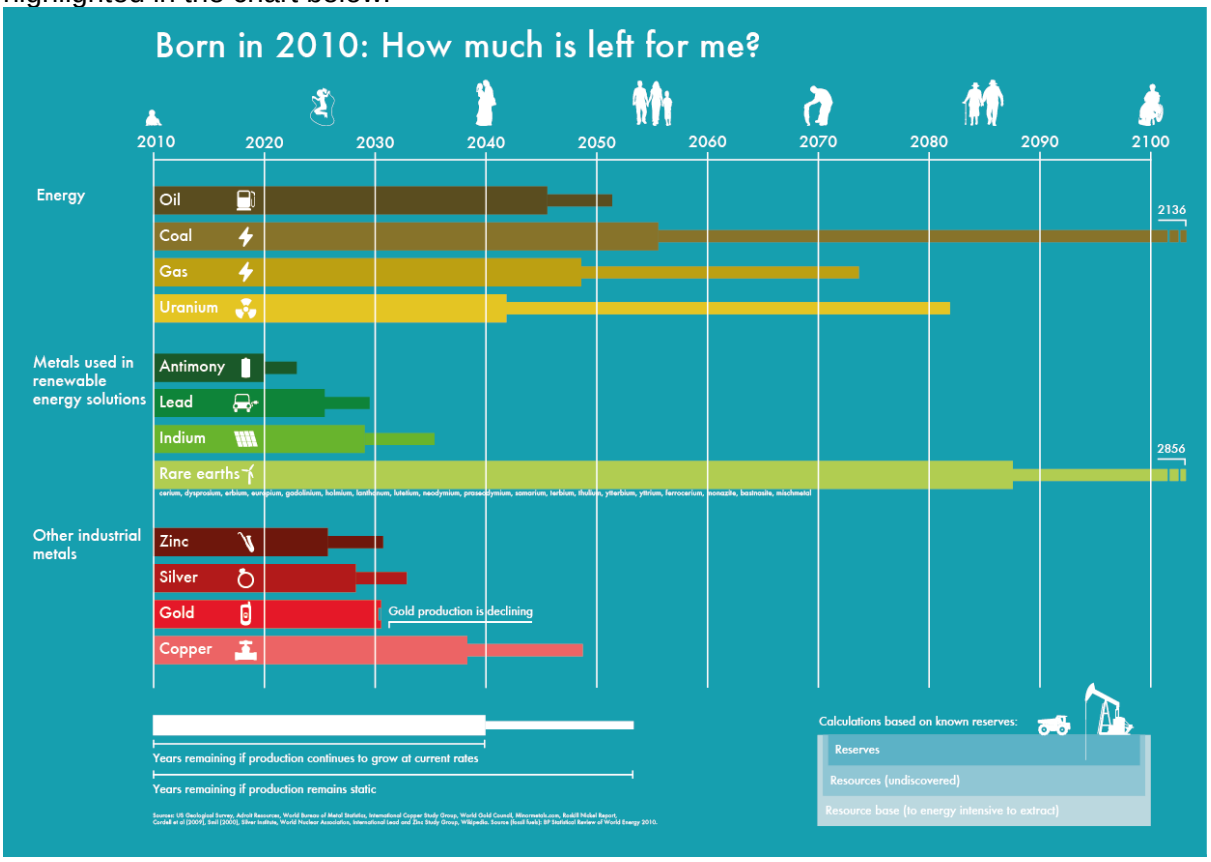


Figure 7: Resource consumption over the years

Overconsumption due to lifestyle changes, higher income levels and increased rate of obsolesce of electrical and electronics goods is leading to overconsumption of resources. Therefore it is necessary to reduce overconsumption and recycle so that we don't run out of resources.

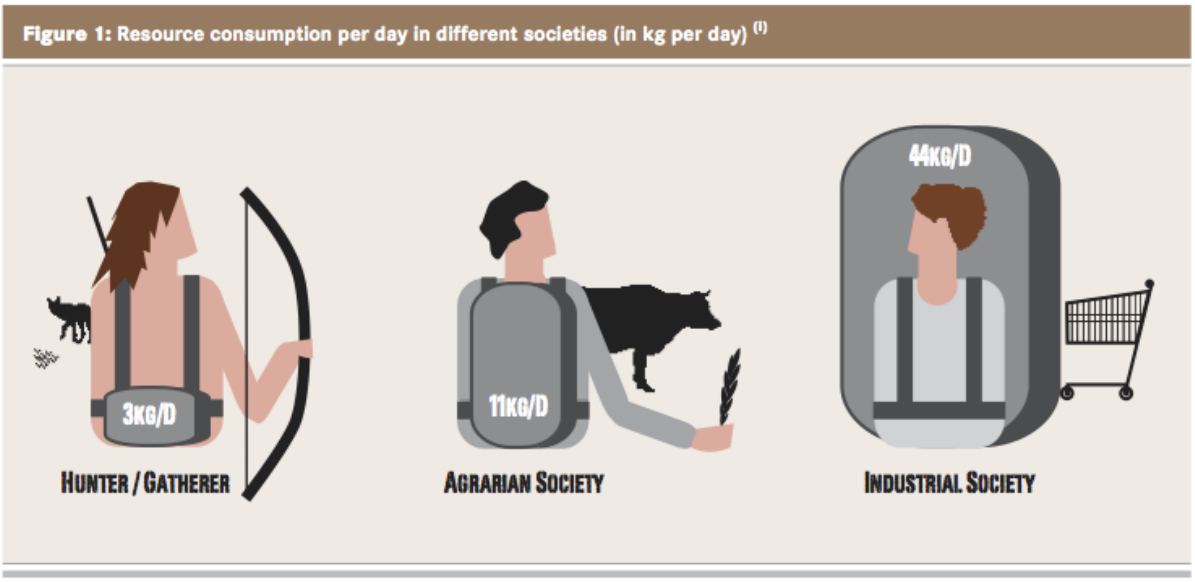


Figure 8: Resource consumption across the ages

Source:

Govt. of Australia, (20011), Background Paper: Resource Consumption, Draft Planning Strategy.
http://www.planning.act.gov.au/__data/assets/pdf_file/0007/25684/Planning_Background11_Resource.pdf

Overconsumption: Our use of the world's natural resources.
https://www.foe.co.uk/sites/default/files/downloads/overconsumption.pdf

Forecast when we will run out of each metal
http://www.visualcapitalist.com/forecast-when-well-run-out-of-each-metal/

Secondary resources:

A secondary resource is something created by the process or consumer of products at their end-of-life for further processing, obviously if it is economically viable to do so. It really is the economic value of secondary resources that drives the recycling system, and the basis of the circular economy. Thus treating secondary resources is principally a matter of considering the economic value that it contains and also the form in which this value is present i.e. the mineralogy, the combinations of materials, linkages etc. The figure below gives a succinct overview of a circular economy

Source:
EC Brussels, 2.7.2014 COM(2014)

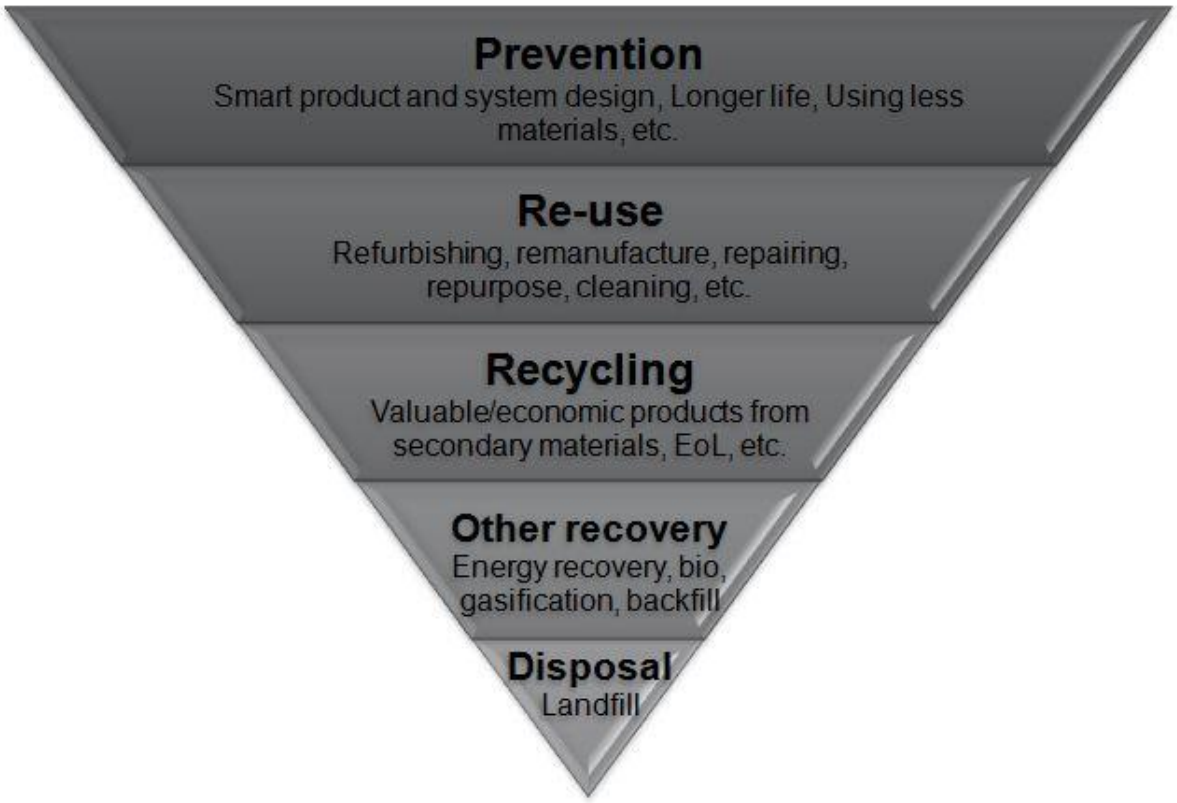


Figure 9: Steps towards a circular economy

The figure very clearly highlights through the “Raw Materials” and “Recycling” sections that process metallurgy is a key aspect in the realization of a closed-loop society. It really is the economic value of secondary resources that drives the recycling system, and the basis of the circular economy.

On the other hand primary resources are mostly extracted through mining operations leading to high economic, social and environmental costs. Use of secondary resources that use waste as a source of materials for building useful products leads to reduction in mining and prevents harmful environmental and social impacts.

Companies have already begun to transform themselves as participants of circular economy by design products that can more readily be recycled and reused. For example, Dell has introduced first computer made with plastics from recycled old electronics.

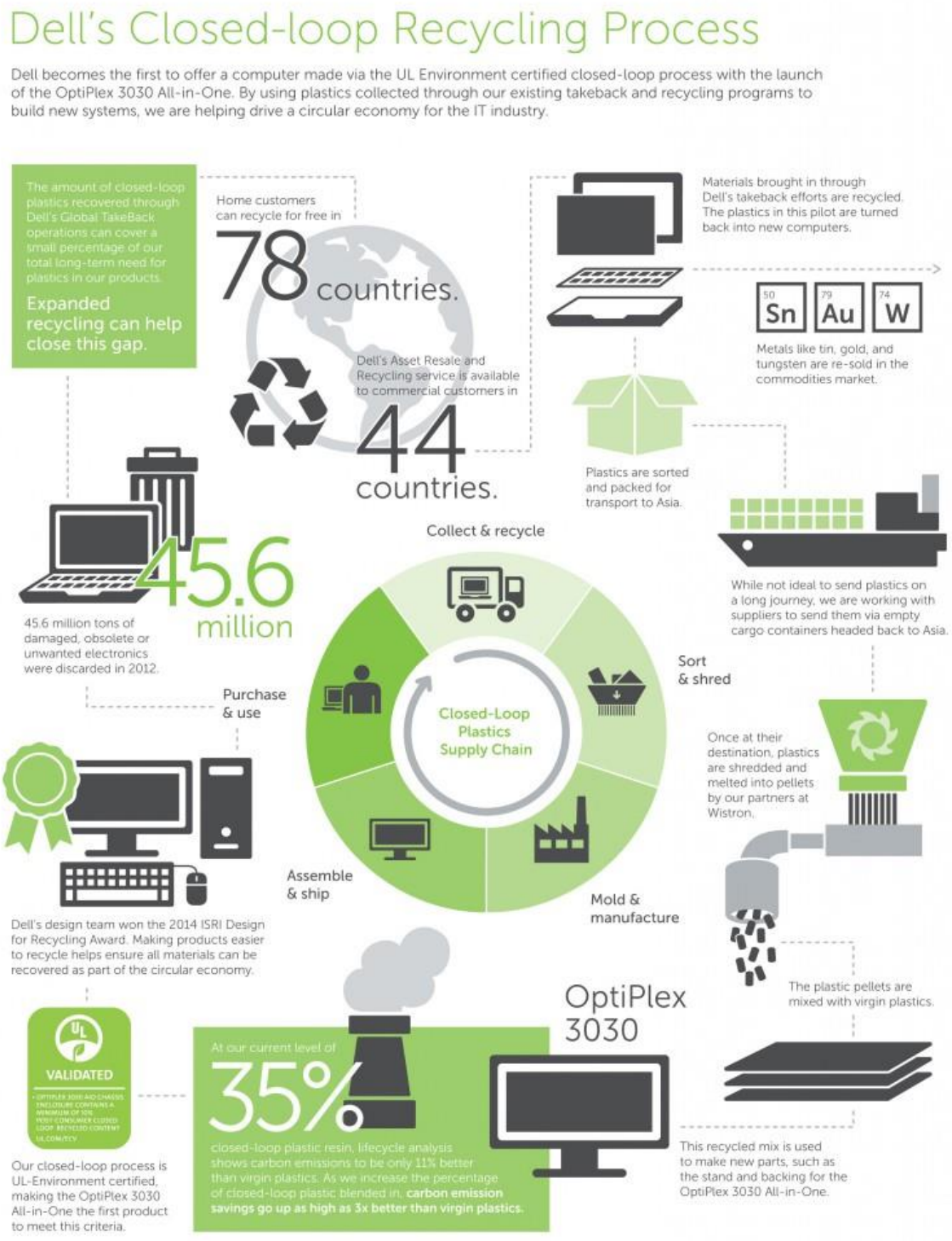


Figure 10: Closed loop recycling process

Source:

USING SECONDARY RESOURCES – TOWARDS SYSTEM INTEGRATED METAL PRODUCTION (SIMP), 30/01/2015, by: Markus Reuter
http://www.outotec.com/en/About-us/Blogs/Experts-thinking-ahead/Metal-and-material-recycling/Dates/2015/1/Using-secondary-resources--towards-System-Integrated-Metal-Production-SIMP/

Dell, (2014), Dell has introduced first computer made with plastics from recycled old electronics.
http://www.electronicstakeback.com/2014/06/12/dell-introduces-first-computer-made-with-plastics-from-recycled-electronics/

LOHAS:

LOHAS is acronym for Lifestyles of Health and Sustainability and is based on the work of US sociologist Paul H. Ray. LOHAS consumers' lifestyle and purchasing decisions are informed by their values regarding personal, family and community health, environmental sustainability and social justice. These values and attitudes are driving the markets for products as diverse as renewable energy, solar hot water, organic foods, recycled and sustainable homewares, domestic rainwater tanks, sustainable timbers, natural cleaning products, alternative medicine, yoga and eco-tourism.

Source:
LOHAS, (2016), Introduction,
http://www.lohas.com.au/what-lohas

Personal Action Plan of LOHAS:

According to the Ellen Macarthur Foundation, today's linear 'take, make, dispose' economic model is reaching its physical limits or is unsustainable. Therefore there is a need to adopt a circular economy that is an attractive and viable alternative as it is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times. As envisioned by the originators, a circular economy is a continuous positive development cycle that preserves and enhances natural capital, optimises resource yields, and minimises system risks by managing finite stocks and renewable flows. It works effectively at every scale.

LOHAS contributes to the concept of circular economy by ensuring that products are used keeping in mind the aim of reducing the adverse environmental and social impacts.LOHAS aims at moving consumers from being purchasers to participants for making a difference in terms of environmental and social impact of the product.

Personal action plan should start with finding and knowing more about the environmental and social impact of the product during manufacturing, use and end of life. For example if we use a television we can find what all metals, minerals and other substances were used to manufacture it and what was the environmental and social impact of the product.

LOHAS consumers actively seek green and sustainable products, support the principle of reduce, reuse and recycle in their day to day life and purchase decisions. Therefore, after the product's impact is know the person should compare the impact of this product with that of similar products available in the market. He or she should actively ask questions about the environmental management system and recycling program of the company. After comparison the consumer adopting LOHAS should opt for the most eco-friendly and recyclable product even if it costs slightly higher. For example, given a choice that you can buy a computer with 50% less harmful materials and made out of recycled plastic, you should buy it even if it is costing more than the computer with high percentage of harmful material and on use of recycled plastics.

For tackling e-waste challenge LOHAS consumers should demand from manufacturers that products should be made with minimum amount of harmful substances and they should ensure that e-waste is collected and managed in an environmentally and socially responsible manner. This will motivate the companies to change their manufacturing process to more sustainable options and implement recycling programs.

Source:

Natural Marketing Institute, (2007), Understand the LOHAS Consumer.
http://www.lohas.se/wp-content/uploads/2015/07/Understanding-the-LOHAS-Consumer-11_LOHAS_Whole_Foods_Version.pdf

Ellen Macarthur Foundation, (2015), Concept of circular economy,
http://www.ellenmacarthurfoundation.org/circular-economy/overview/concept

Occupational Health and Safety (OHS) issues around improper handling of e-waste

e-waste contains a wide range of hazardous compounds that may be released during improper handling thereby becoming a threat to humans and the environment. In addition, in some processes used, new hazardous compounds, such as dioxins, may be formed as the original e-waste components are degraded. Most risks arise during the uncontrolled e-waste recycling activities using rudimentary methods. These include manual disassembly and sorting; heating and acid leaching of printed circuit boards (PC-boards); shredding, melting and extrusion of plastics; open burning of plastic coated wires and other components; and sweeping and collection of toners from toner cartridges. These activities are mostly carried out directly on the ground in open air or in poorly ventilated workshops, and involve minimal emission control systems and personal protection for the workers.

Humans and the environment in the areas where this is carried out may therefore be highly exposed to the emissions generated. The recycling workers and the local residents are particularly exposed via dust generated during dismantling and shredding processes, and fumes and smoke generated during acid digestion processes and various high temperature processes, such as open burning and heating, melting, and extrusion processes. The environment is mainly contaminated from the open burning processes and through leakage from dumped residue of various recycling activities, e.g. stripped cathode ray tubes (CRTs) and PC-boards, spent acids from the digestion processes and residual ashes. On the whole, lead seems to be particularly problematic among the metals, and dioxins (chlorinated and brominated) and polybrominated diphenyl ethers (PBDEs) among the organic compounds. These compounds are all very toxic and may potentially be emitted in large amounts during rudimentary e-waste recycling activities. Lead and PBDEs because they both are highly abundant in e-waste, and dioxins because the formation conditions many times are ideal in the processes used. As a consequence, extremely high levels (in some cases the highest ever measured) of these compounds have been measured in environmental as well as human samples collected in areas where uncontrolled e-waste recycling is taking place. Risks also arise when e-waste is treated as general municipal solid waste. During incineration, a wide variety of hazardous compounds may be emitted to the atmosphere via the smoke and exhaust gases, both in gaseous form and bound to particles.

The compounds emitted may be those that were present in the original waste, but probably more important are those compounds that may be formed during the incineration processes, e.g. PCDD/Fs and PBDD/Fs. This is because the e-waste, being a complex fuel, may function as precursors for many different compounds in thermal processes. In fact, the conditions for dioxin formation are many times ideal when e-waste is incinerated, which is partly due to the presence of PVC-plastics and BFRs as dioxin precursors and partly due to the presence of copper and antimony as very potent catalysts in the transformation reactions. In modern incineration facilities the emission of these and other compounds may be minimized by process optimization and flue gas treatment systems. However during landfilling, hazardous compounds may leak to the surrounding environments, including nearby surface water and groundwater reservoirs, and also evaporate to the atmosphere. Leakage may occur for most compounds in the waste due to the long time span involved, but of particular concern are the leakage of lead and various other metals, as well as PBDEs and phthalate plasticizers. Evaporation mainly occurs for volatile compounds, of which mercury and its methylated derivatives are of most concern. The extent of leakage and evaporation from a landfill depends on the properties of the contaminants in question, but also on the design of the landfill (i.e. if it is open or sealed), the properties of the material being stored (e.g. type of waste, if it has been pre-treated in some way etc.), and on various environmental factors such as the ambient temperature and pH and humic content in the infiltrating water (SEPA, (2011)).

Source:

Swedish Environmental Protection Agency, (2011), Recycling and disposal of electronic waste Health hazards and environmental impacts, Report 6417.

4.Labeling Mechanisms in Electronics:

Bar Coding for Electronic Manufacturing

Manufacturers know that time to market, customer satisfaction,and cost control is critical to competing in a global economy. Maximizingproductivity, efficiency, tracking and process improvementsare key to success.

Labeling and bar code systems are widely employed to automateaccurate and versatile identification systems.

Bar coding provides accurate and productive ways to:

- Track inventory, production, work -in-process and customer orders in real-time.
- Track warehouse and stock-room operations and cut the time needed for cycle counting and inventory validation.
- Prevent employee mistakes such as picking the wrong materials.
- Automate data capture in shipping and receiving.
- Collect tracking and traceability records to meet customer, industry standard and US Government mandates.
- Increase responsiveness, improve customer service, and enhance productivity.

Bar coding was adopted throughout the electronic manufacturingand assembly industry as part of an effort to capture data before,during and after production.This data stays with the components or units and becomes animportant link in the production and supply chain process.Labels designed for electronic assembly and PC Board identificationmust last the life of the product and keep the data intact. Thisrequires durable labels designed to withstand harsh environmentprocessing including contact with chemicals, aqueous washes, extremehigh temperatures, wave flow soldering, or reducing ESD.

High Density Bar Codes for Electronics

Because of shrinking real estate on the electroniccomponents, two-dimensional (2D) symbologies have gainedpopularity. 2D bar codes offer greater data storage capacityusing high-density identification and error correction features, 2Dsymbologies are commonly used to store data needed to trackparts, WIP, provide traceability and more.

Figure 11: High Density of Bar Codes

Source: http://www.barcodehq.com/primer.html

What Is The Data Matrix Code?

The Data Matrix code is a two-dimensional matrixsymbology containing dark and light square data modulesmaking up a larger square or rectangular shaped symbol.It has a finder pattern of two solid lines and two alternating darkand light lines on the perimeter of the symbol.

A two dimensional imaging device is necessary to scan thesymbology - this is different from linear bar code scanners usedtoday. Data Matrix is designed with a fixed level of error correctioncapability. Data Matrix is used for item marking applicationsusing a wide variety of printing andmarking technologies.

The DataMatrix symbol looks like this:

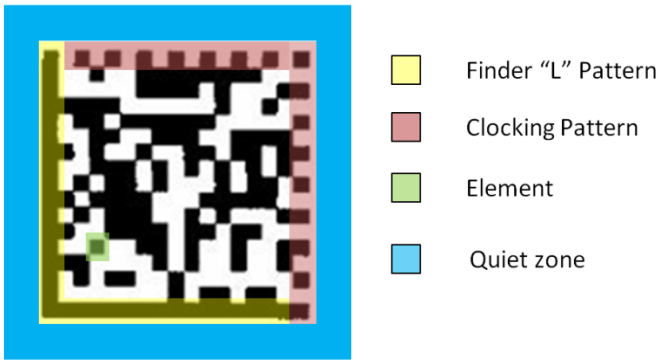


Figure 12: Anatomy of a Datamatrix Code

Source: http://cross-automation.com/blog/advantages-utilizing-2-dimensional-datamatrix-barcodes

The Data Matrix code was designedto withstand a fair amount ofdestruction and have the encodeddata remain readable. Meaning awhole section of the code can be scratched or completelygone and the mark will still read.The other feature of the Data Matrix code is the ability to be readfrom different angles. This makes it easier and far more efficientto scan marked objects without the worryor effort to align them in one direction.

Standard Mark and labeling requirements under BIS Compulsory Registration Scheme for Electronic and IT Products:

To simplify the labelling requirements Bureau of India Standard (BIS) has notified the 'Standard Mark' for the Registration Scheme on 01 December 2015.

The guidelines for use of Standard Mark for the Compulsory Registration Scheme of BISare given below:

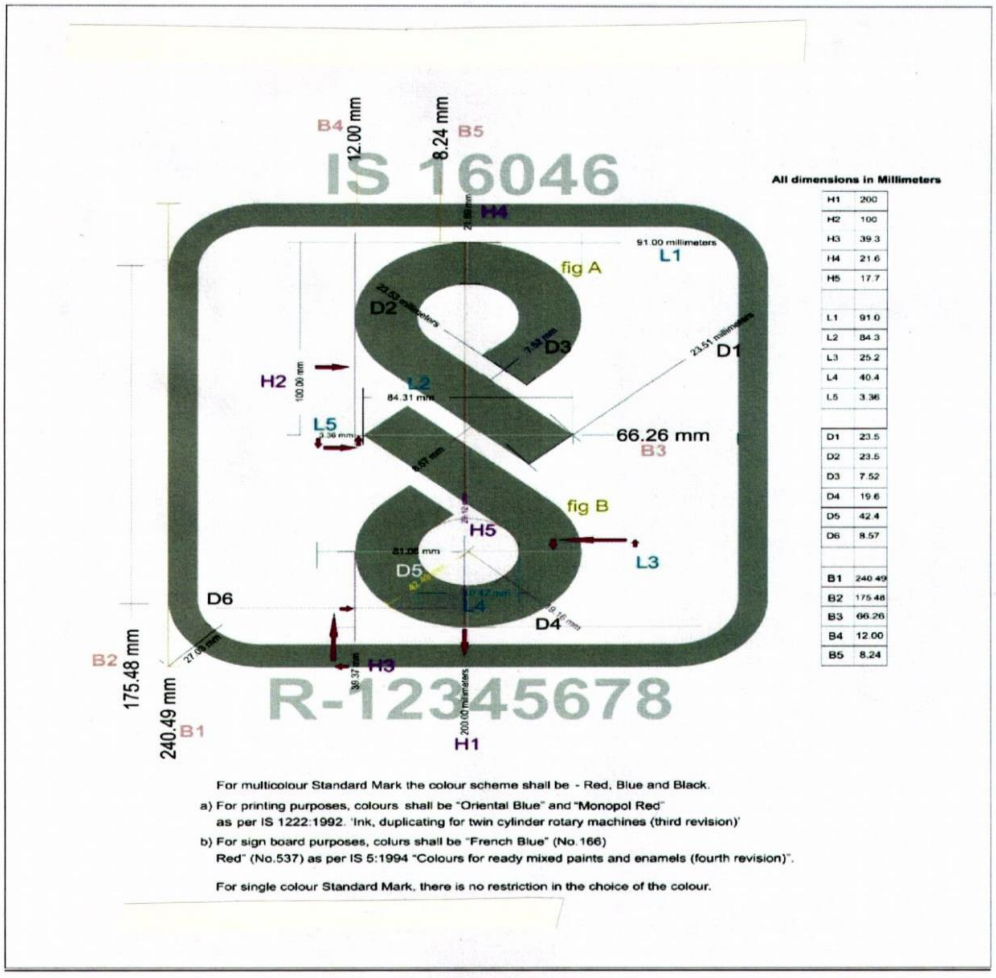
i. The monogram of the 'Standard Mark' consists of the pictorial representation, drawn in the exact style as indicated in the figure i. Its photographic reduction and enlargement is permitted.

ii. The 'Standard Mark' can be displayed in single colour or multi-colour as per the details given in Annexure I. The colour scheme for the Standard Mark to be used in multi-colour shall be used as indicated in figure II

iii. The registered user shall display the 'Standard Mark' or the words 'Self Declaration-Conforming to IS…….' along with Registration number on the article and/or the packaging, as the case may be, in a

manner so as to be easily visible. It shall be legible, indelible and non-removable. Further, the durability of marking shall be as per the provisions of the relevant Indian Standard, wherever applicable. The display of IS number, Registration number and words shall not be less than Arial font size 6.

The registered users now have the option of either using the Standard Mark or use thewords 'Self declaration--Conforming to IS..... ' along with Registration number.



The IS number and registration number given above are examples only. Please also refer Gazette Notification S. O. 3240(E) dated 01 December 2015, for display of IS numbers for each product.

Figure 13: Measurement for the 'Standard Mark' for 'Registration'

Figure 14: Colour Scheme for the 'Standard Mark' for Registration

5. The E-waste (Management) Rules, 2016 and the challenges of implementing the Rules

E-Waste (Management) Rules, 2016- What's New?

1. To address leakage of e-waste to informal sector at all the stages of channelization, manufacturer, dealer, refurbisher and Producer ResponsibilityOrganization (PRO) have been introduced as additional stakeholdersin the rules.

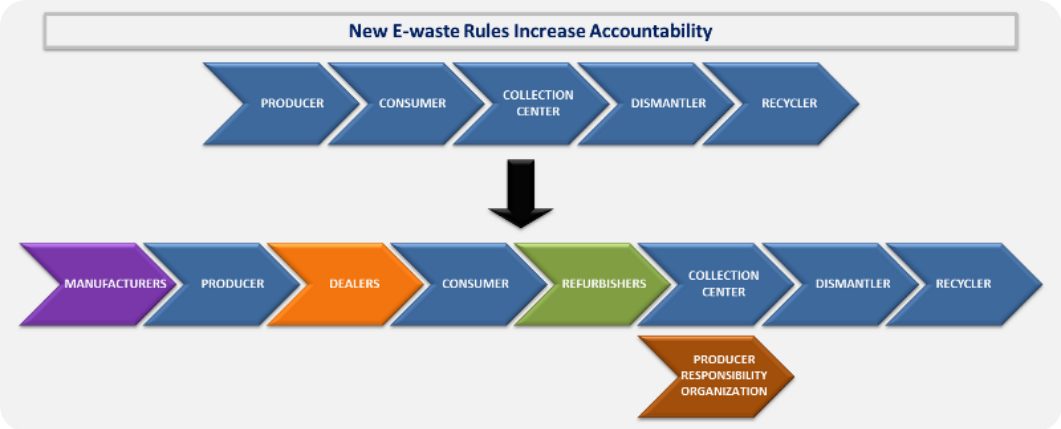


Figure 15: Stakeholders according to new Rule

Source:http://www.sustainabilityoutlook.in/content/e-waste-management-india-new-rules-old-problems-756361

2. Bulk of e-waste comprises of components, consumables, spares and parts of EEE which were not getting addressed in previous rules entailing to the scope of their channelization to informal sector. The applicability of the rules has been extended to components,consumables, spares and parts of EEE in addition to equipment aslisted in Schedule I.
3. Taking into account the lack of any regulation for management of CFL and other mercury containing lamp, CFL has been included in Schedule I which provide the list of EEE to which this rules is applicable.
4. Exemption continues for micro enterprises; however small enterprises, which have been referred as one of the major source of generation of e-waste, have been included in the rules for responsibility as manufacturer, **without burdening them with EPR responsibility as applicable to Producers.**
5. Collection mechanism based approach has been adopted to includecollection centre, collection point, take back system etc for collectionof e-waste by Producers under Extended Producer Responsibility(EPR). Shift from collection centre to collection mechanism approach and removal of

need of separate authorization will ensure effective collection simultaneously ensuring flexibility for Producers for implementation. This will check leakage of flow of e-waste to unauthorised players

6. Option has been given for setting up of PRO, e-waste exchange, e- retailer, Deposit Refund Scheme as additional channel forimplementation of EPR by Producers to ensure efficientchannelization of e-waste.
7. Provision for Pan India EPR Authroization by CPCB has beenintroduced replacing the state wise EPR authorization.
8. Collection and channelisation of e-waste in Extended ProducerResponsibility - Authorisation shall be in line with the targetsprescribed in Schedule III of the Rules. The phase wise CollectionTarget for e-waste, which can be either in number or Weight shall be30% of the quantity of waste generation as indicated in EPR Planduring first two year of implementation of rules followed by 40%during third and fourth years, 50% during fifth and sixth years and70% during seventh year onwards. Target based approach (Minimum) is being used in many countries like Japan (redcycling rate 50% to 60%), South Korea (Recyxcling rate 55% to 70%), UK (Recycling and recocvery rate 50% to 80%) and Netherlands (recycling rates 45% to 75%).
9. Deposit Refund Scheme, an optional financial mechanism for effective implementation of EPR, has been introduced as an additional economicinstrument wherein the producer charges an additional amount as adeposit at the time of sale of the electrical and electronic equipmentand returns it to the consumer along with interest when the end-oflifeelectrical and electronic equipment is returned.
10. The e-waste exchange as an option has been provided in the rules as anindependent market instrument offering assistance or independentelectronic systems offering services for sale and purchase of e-wastegenerated from end-of-life electrical and electronic equipmentbetween agencies or organizations authorised under these rules.
11. The manufacturer is also now responsible to collect e-waste generatedduring the manufacture of any electrical and electronic equipmentand channelise it for recycling or disposal and seek authorizationfrom SPCB.
12. The dealer, if has been given the responsibility of collection on behalf ofthe producer, need to collect the e-waste by providing the consumer abox and channelize it to Producer. This will provide flexibility to producer for channelization and ensure ease of implementation by consumers for depositing the e-waste at end of life.
13. Dealer or retailer or e-retailer shall refund the amount as per take backsystem or Deposit Refund Scheme of the producer to the depositor ofe-waste.
14. To check the leakage in informal sector, refurbisher need collect e-waste generated during the process ofrefurbishing and channelise the waste to authorised dismantler orrecycler through its collection centre and seek one time authorizationfrom SPCB.
15. To bring clarity in respect of definition and to put obligations on bulk consumers who are major generators and whose compliance was non satisfactory due to lack of any concrete obligation on reporting, health care facilities which have turnover of more than one crore or have more than twenty employees' has been added as Bulk Consumer list. They need to file annual returns.
16. The roles of the State Government has been also introduced in the Rulesin orderto ensure safety, health and skill development of the workersinvolved in the dismantling and recycling operations.
17. Department of Industry in State or any other government agencyauthorised in this regard by the State Government is to ensureearmarking or allocation of industrial space or shed for e-wastedismantling and recycling in the existing and upcoming industrialpark, estate and industrial clusters.
18. Department of Labour in the State or any other government agencyauthorised in this regard by the State Government need to ensurerecognition and registration of workers involved in dismantling andrecycling; assist formation of groups of such workers to facilitatesetting up dismantling facilities; undertake industrial skilldevelopment activities for the workers involved in dismantling andrecycling; and undertake annual monitoring and to ensure safety &health of workers involved in dismantling and recycling.
19. State Government to prepare integrated plan for effectiveimplementation of these provisions, and to submit annual report toMinistry of Environment, Forest and Climate Change.

20. To prevent leakage of e-waste to informal sector during transportation, transportation of e-waste shall be carried out as per the manifestsystem whereby the transporter shall be required to carry adocument (three copies) prepared by the sender, giving the details.
21. Liability for damages caused to the environment or third party due toimproper management of e-waste including provision for levyingfinancial penalty for violation of provisions of the Rules has also beenintroduced.
22. To bring clarity in the rules for effective implementation and prevent leakage to informal sector, urban Local Bodies (Municipal Committee/Council/Corporation) hasbeen assign the duty to collect and channelized the orphan productsto authorized dismantler or recycler.

Salient Features of the E-waste (Management) Rules, 2016 and its likely implication

E-Waste (Management & Handling Rules), 2011	**E-Waste (Management Rules, 2016**	**Reasons/ and Likely implications**
Title		
E-Waste (Management & Handling Rules), 2011	E-Waste (Management Rules, 2016	
Applicability		
Producer, Consumer or bulk consumer, collection centre, dismantler and recycler	Expanded to manufacturer, dealer, refurbisher and Producer Responsibility Organization (PRO)	To address leakage of e-waste to informal sector at all the stages of channelization.
Only to electrical and electronic equipment (EEE)	Extended to components, consumables, spares and parts to EEE in addition to equipment as listed in Schedule	Bulk of e-waste comprises of components, consumables, spares and parts of EEE which were not getting addressed in previous rules entailing to the scope of their channelization to informal sector.
	Compact Fluorescent Lamp (CFL) and other mercury containing lamp brought under the purview of rules.	Taking into account the lack of any regulation for management of CFL and other mercury containing lamp, CFL has been included in Schedule I which provide the list of EEE to which this rules is applicable.
Exemption		
Micro and Small industry sector as defined in Micro small and Medium Development Act, 2006	Micro enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006	Exemption Continues for micro enterprises, however small enterprises, which have been referred as one of the major source of generation of e-waste, have been included in the

		rules for responsibility as manufacturer, **without burdening them with EPR responsibility as applicable to Producers.**
Collection Mechanism		
Collection centers can be set up by producer or by any person or agency or Association for the purpose of collecting e-waste. Separate authorization from SPCBs for setting up of such collection centres was necessary.	Collection is now exclusively Producer's responsibility, which can set up collection centre or point or even can arrange buy back mechanism for such collection. No separate authorization for such collection will be required, which will be indicated in the EPR Plan of Producers.	The rules Provide for setting up of individual collection centres which were not necessitated as part of EPR Authorization, thus giving leeway to producers for not setting up such collection centres. Shift from collection centre to collection mechanism approach and removal of need of separate authorization will ensure effective collection simultaneously ensuring flexibility for Producers for implementation. This will check leakage of flow of e-waste to unauthorized players.
Extended Producer Responsibility (EPR)		
The Producers are required to obtain authorization from SPCBs/PCCs for implementing their Extended Producer Responsibility for effective channelization of E-waste to the registered dismantlers/recyclers	Single EPR Authorization for Producers is now being made CPCBs responsibility to ensure pan India implementation. Procedure for seeking the authorization and for effective implementation has now been elaborated with various kinds of flexibilities provisions.	Need for separate EPR authorization from each state lead to significant delays and thus failure in implementation of EPR There had been significant lack of initiatives from Producers wrt implementation of EPR and for capacity building and awareness initiative, though mandated in the rules due to lack of elaborate procedure for the same in the rules which has now been elaborated step-wise
Flexibility for ease of implementation of EPR		
No Provisions	Option has been given for setting up of PRO e-waste exchange, e-	These are various non-mandatory options for ease

	retailer, Deposit Refund Scheme as additional channel for implementation of EPR by Producers to ensure efficient channelization of e-waste	of implementation of EPR
Target based approach for collection under EPR		
No such Provision	Collection and channelization of e-waste in Extended Producer Responsibility- Authorisation shall be in line with the targets prescribed in Schedule III of the Rules. The Phase wise collection Target for e-waste which can be either in number or weigh shall be 30% of the quantity of waste generation as indicated in EPR Plan during first two year of implementation of rules followed by 40% during third and fourth years, 50% during fifth and sixth years and 70% during seventh year onwards.	Target based approach for implementation of EPR has been Adopted on the basis of existing international best practices which indicate higher success rate for implementation of EPR in those countries having target based EPR Mechanism. Target Based approach (Minimum) is being used in many countries like Japan (recycling rate 50%) to 60%), South Korea (Recycling rate 55% To 70%), UK (Recycling and recovery rate 50% to80%) and Netherlands (recycling rates 45% to 75%). As it may be noted in all these countries target is with reference to successful recycling rate, whereas in India we have just began with adoption of successful collection rate to begin with., Further, the minimum target has been 45-55% internationally. Whereas, in India in order to gain experience the target has been kept as collection rate of 30% of the total e-waste generated as per the EPR plan submitted by Producer themselves. In order to ascertain the

		annual quantity of waste generated, category wise average life and the weight shall be used and this will be applied tom sales figure of the producers to arrive at the quantity of e-waste generation. All the details will be prescribed in the CPCB guidelines.
Simplification of Permission		
Authorization for collection centre, Dismantler and Recyclers to obtain Authorization and Registration, separately. Separate EPR authorization by all the states.	No separate authorization for collection centre which shall be part of EPR now Registration/authorization for dismantling and recycling through one system i.e. Authorization instead of both registration and authorization Pan India EPR authorization by CPCB	Simplification of various permissions to avoid delays.
Economic Instrument for implementation of the rules		
No specific citation	Deposit Refund Scheme has been introduced as an additional economic instrument wherein the producer charges an additional amount As a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of-life electrical and electronic equipment is returned.	As optional financial mechanism for effective implementation of EPR
E-waste Exchange		
No specific citation	The e-waste exchange as an option has been provided in the rules.	The e-waste exchange as an option has been provided in the rules as an independent market instrument offering assistance or independent electronic systems offering services for sale and purchase of e-waste generated from end-of-life electrical and electronic equipment between agencies or organizations authorized under these

		rules.
Responsibilities of Manufacturer		
No Provision	To collect e-waste generated during the manufacture of any electrical and electronic equipment and channelize it for recycling or disposal and seek authorization from SPCB.	To check the leakage to informal sector.
Responsibilities of dealers		
No Provision	In the case the dealer has been given the responsibility of collection on behalf of the producer, the dealer shall collect the e-waste by providing the consumer a box. Dealer or retailer or e-retailer shall refund the amount as per take back system or Deposit refund Scheme of the producer to the deposition of e-waste	This will provide flexibility to producer for channelization and ensure ease of implementation by consumers for depositing the e-waste at end of life.
Responsibilities of the Refurbisher		
No Provision	Collect e-waste generated during the process of refurbishing and channelise the waste to authorised dismantler or recycler through its collection centre and seek one time authorization from CPCB.	To check the leakage to informal sector.
Obligations for Bulk Consumer		
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, partnership and public or private companies that are registered under the Factories Act. 1948(63 of 1948) and the Companies Act, 2013 (18 of 2013)	Bulk Consumer is being redefined by adding and health care facilities which have turnover of more than one crore or have more than twenty employees. They need to file annual returns.	To bring clarity in respect of definition and to put obligations on bulk consumers who are major generators and whose compliance was non satisfactory due to lack of any concrete obligation on reporting

No provision on annual return		
Responsibility of State Government		
No Provision	The roles of the State Government has been also introduced in the Rules in order to ensure safety, health and skill development of the workers involved in the dismantling and recycling operations. These responsibilities are as given below; (i) Department of Industry in State or any other government agency authorised in this regard y the State Government in to ensure earmarking or allocation of industrial space or shed for e-waste dismantling and recycling in the existing and upcoming industrial part, estate and industrial clusters; (ii) Department of Labour in the State or any other government agency authorised in this regard by the State Government need to ensure recognition and registration of workers involved in dismantling and recycling; assist formation of groups of such workers to facilitate setting up dismantling facilities; undertake industrial skill development activities for the workers involved in dismantling and recycling, and undertake annual monitoring and to ensure safety &	Involvement of state government for effective implantation of the rules and simultaneously ensure welfare, safety and health of the workers involved in this e-waste management sector.

	health of workers involved in dismantling and recycling (iii) State Government to prepare integrated plan for effective implementation of these provisions, and to submit annual report to Ministry of Environment, Forest and Climate Change.	
Reduction of Hazardous Substances (RoHS) during manufacturing stage		
Every producer of electrical and electronic equipment and their components or consumables or parts or spares listed in Schedule I shall ensure that, new Electrical and Electronic Equipment and their components or consumables or parts or spares do not contain Lead, mercury, Cadmium, Hexavalent Chromium, Polybrominated biphenyls and Polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, Polybrominated biphenyl and Polybrominated diphenyl ethers and of 0.01% by weight in homogenous materials for cadmium.	The procedure for implementation of RoHS has been elaborated and made explicit Provision on Reduction of Hazardous Substances (RoHS) And related schedule II has been revised in line with existing EU regulatory framework which forms the basis of the provision. In case the products not comply with the RoHS provision, has been introduced to withdraw or recall the product from market and take corrective measures to bring the product into compliance.	For effective implementation In line with existing international best practices. Stringent compliance mechanism
Transportation of E-waste		
No provision	The transportation of e-waste shall be carried out As per the manifest system whereby the transporter shall be required to carry a document (three copies) prepared by the sender, giving the details as per Form-6;	To prevent leakage of e-waste to informal sector during transportaiton

Liability provision		
No provision	Liability for damages caused to the environment or third party due to improper management of e-waste including provision for levying financial penalty for violation of provisions of the Rules has also been introduced.	For effective implementation
Responsibility of Urban Local Bodies		
No specific citation	Urban Local Bodies (Municipal Committee/Council/Corporation) has been assign the duty to collect and channelized the orphan products to authorized dismantler or recycler.	To bring clarity in the rules for effective implementation and prevent leakage to informal sector

Guidelines for Producer Responsibility Organization (PRO)

[Under E-waste (Management) Amendment Rules, 2018]

1. Background:

In the E-waste (M) Rules, 2016, Producers of Electrical and Electronic Equipment (EEE) have been given options to manage their extended producer responsibility (EPR) either individually or collectively through a producer responsibility organisation (PRO) recognised by the producer or producers in their EPR-Authorisation. As per Rule 13 (1) (xvii) of E-Waste (Management) Amendment Rules, 2018, a PRO shall apply to the Central Pollution Control Board for registration to undertake the activities prescribed for Producer Responsibility Organisations under these Rules. The said rules prescribed the activities to be carried out by the PRO in the definition of the PRO. However, in the said rules procedure of registration and criteria for registration has not been detailed out. In view of the above, this document has been prepared to provide a framework for registering PRO.

2. Definition of PRO:

As per rule 3(dd), 'Producer Responsibility Organisation (PRO) means a professional organisation Authorised or financed or collectively or individually by producers, which can take the responsibility for collection and channelization of e-waste generated from the 'end-of-life' of their products to ensure environmentally sound management of such e-waste.

3. Role of PRO:

A PRO Can assist a producer or producers in meeting their legal obligations (Achieving collection targets, setting up of collection centres/points/implementing take back, carrying awareness programmes etc.), only if producer (S) engage that PRO.

- PRO shall have an agreement with producer (s) or a consortium of producers. Such agreement shall outline the role and responsibility of PRO for managing EPR.

4. Activities of PRO:

1. Collection and Channelization of e-waste on behalf of authorised producers for environmentally sound management of such waste. Producers may engage PROs for specific or multiple tasks relating to management of their EPR

2. The activities of PRO may include one or more of the following tasks.

I. Establishment of collection mechanism (door to door collection/collection campaign/e-waste exchange platform/procurement form individuals)

II. Implementation of buy back/take back/DRS/e-waste exchange

III. Establishment of collection centres/points this may include setting up of collection godowns or operating through warehouses as per the guidelines of CPCB

IV. Implementation of take back

V. Logistics arrangements

VI. Ensuring traceability of the e-waste collected and channelized

VII. Ensuring Environmentally sound dismantling and recycling of e-waste

VIII. Conducting awareness programme among consumer's/bulk consumer/producers for collection and channelisation of e-waste

IX. Helping producers in filling of quarterly/annual returns as per the rules.

CENTRAL POLLUTION CONTROL BOARD

WASTE MANAGEMNT-III DIVISION

Date: 06.06.2019

Kind Attention: Custom/Port Authorities, State Pollution Control Boards, Pollution Control Committees, Manufacturers, Consumers and Bulk Consumers.

Sub: Clarification Regarding Non-Applicability of EPR Authorization under E-waste (Management) Rules, 2016 as amended thereof – Regarding

A. EPR Authorization is **NOT** required in case;

1. The Electrical and Electronic Equipment (including their spare components, consumables) not listed in the **Schedule-I E-waste (Management) Rules, 2016.**
2. The import of Electrical Equipment is for the purpose of selling to EPR Authorized Producers. Provided that the importer submits the following documents to Customs/Port Authorities;

i. Copy of agreements with EPR Authorised Producers for whom the importer is importing.

ii. Copy of EPR Authorization of the Producer (s) for whom the importer is importing.

iii. Letter from EPR- Authorised Producers that Importer is importing on behalf of EPR- Authorised Producer.

3. Import of spares (old or new) by **actual users*** from original equipment manufacturers (OEM) for the purpose of warranty replacement, provided equal number of defective or non-functional parts are exported back within a year in accordance to document verification by **Custom Authorities** as specified under **Schedule VIII (4-e)** of Hazardous waste and Other wastes (Management and Transboundary Movement) Rules, 2016

***Actual user from OEM is the warranty service provider from OEM**

B. EPR Authorization is **NOT** applicable to;

4. Consumers or Bulk Consumers if they import Electrical and Electronic Equipment (EEE) for self or captive use. Provided that the consumer or Bulk consumer submits self-declaration on stamp paper declaring that EEE item being imported are intended for sale for captive e use and not for sale to Customs/Port Authorities.

5. Manufacturers of Electrical and Electronic Equipment (including their spare components, consumables) listed in the Schedule-I of E-waste (Management) Rules, 2016 if they Are manufacturing and/or importing for the purpose of selling exclusively to EPR-Authorised producers. Provided that the manufacturer submits the following documents to Customs/Port Authorities;

(i) Copy of agreements with EPR Authorised Producers for whom it is manufactured or imported.

(ii) Copy of EPR Authorisation of the Producer (s) for whom it is manufactured and/ or imported.

(iii) Letter from EPR-Authorised Producers stating that the EEE is manufactured and/ or imported on behalf of EPR-Authorised Producer.

Central Pollution Control Board

WM-III Division

F .No. B-29016/ (EPR)/ 18/WM-III Div. **Dated: 04/12/2018**

Kind Attention:

EPR Authorized Producers

Sub: Maintenance of documents for compliance of rule 16 of E-waste (Management) Rules, 2016 related to Reduction in the use of Hazardous Substance (RoHS) in the Manufacture of Electrical electronic Equipment and their Components or Consumables or parts

It is to inform that CPCB has started inspection of EPR Authorized Producers for verification of documents and activities for implementation of Extended Producer Responsibility (EPR)

It has been observed that many of the Producers were not maintaining records related to RoHS compliance for which they had submitted self-declarations to CPCB while seeking EPR authorization.

EPR Authorized Producers are hereby advised and informed that they have to maintain technical documents pertaining to RoHS compliance, failing which EPR Authorisation shall be suspended/cancelled.

Attention: Authorised Recyclers of E-waste documents to be retained for verification for compliance of collection targets

- Copy of destruction certificate issued to producers
- Form-6; E-waste Manifest (Pink Copy)
- Form-2 for maintaining records of E-waste handled, dismantled and recycled
- Dharma kanta (Weigh Bridge) receipt and pictures of the vehicle showing their registration number as proof of transportation of e-waste
- E-bay Bill
- Details of different items (Category wise) after segregation.
- Transaction details of funds a proof that dismantled e-waste has been further recycled
- Authorisation certificate in original;
- Pass book in original
- Consent to operate in original
- Authorization under Hazardous and other wastes (Management an transboundary Movement) / /Rules, 2016 for disposal of Hazardous and other wastes

Steps for making an application for EPR- Authorisation

Step-1

- Make application in Form-1, of E-waste (Management) Rules, 2016
- For downloading Form-1, one has to go to CPCB web Site.
- The web link is http;//cpcb.nic.in/index.php
- On the home page of CPCB website first go to 'Projects' and in the drop down menu select 'Waste Management' then in the next drop down menu select 'E-Waste'. Under 'E-Waste and under the rules following two items are available.
    - E-waste Rules, 2016
    - Form – 1 of E-Waste Rules, 2016
    - The Form- 1 is available at http://cpcb.nic.in/e-waste/

Step-2

Filling of Form-1 of E-waste (Management) Rules, 2016

Application can be filled up with the help of guidelines (Final Guidelines on Implementation of E-Waste) Rules 2016- available at link http://cpcb.nic.in/technical-guidelines-4/) and procedures of processing application (Final Procedure for Processing EPR Application under e-waste Rules 2016- available at link http://cpcb.nic.in/application-for-epr-authorization-under-rule-13/)

Additional Information:

EPR- Authorization is required by producers of notified equipments (their components or consumables or parts or spares) listed in Schedule I of E-waste (Management) Rules, 2016 And is A permission to A producer for managing Extended Producer Responsibility with Implementation Plans and targets outlined in such authorisation.

EPR- Plan means a plan submitted by a producer at the time of applying for Extended Producer Responsibility- Authorisation in which a producer shall provide details of e-waste channelization system for targeted collection.

Documents to required:

- EPR Plan (Complete as per guidelines and procedures for processing application)
- Self-declaration for compliance of Reduction of Hazardous Substance (RoHS) provision As per the format given in the guidelines And in the procedures of processing application.
- Copies of agreement document with dismantlers, recyclers, and Treatment, Storage & Disposal Facilities (TSDFs) etc.
- Declaration for availability of the technical documents as per EN 50581 of EU
- Copy of the permissions/licences from the relevant ministry/department for marketing various products or for doing the business such;

i) GST details, ii) PAN details, iii) Copy of Incorporation Certificate, if applicable, iv)Copy of IEC in case of importers

- Self- attested copy of authorisation of dismantlers/recyclers
- List of producers attached with the dismantlers/recyclers along with producer's collection targets

Revised SOPs for Grant of EPR- Authorisation under E-waste (Management) Rules, 2016 as Amended

12th April, 2018

Central Pollution Control Board
Hazardous Waste Management Division
(Ministry of Environment, Forest & Climate Change, Government o India)
'Parivesh Bhawan', East Arjun Nagar

1.0 SOPs for EPR-Authorisation

As per Rule 13 (1) (ii), (iii) & (vi) of E-Waste (Management) Rules, 2016, CPCB has the mandate to grant, renew or refuse EPR- Authorization to Producers of the Electrical & Electronic Equipment (EEE) listed in Schedule- I of the said Rules. CPCB shall evaluate the applications, received and grant EPR-Authorisation within 120 days of receipt to only those applications, which are complete with requisite information. Scrutiny of application would be as per the information specified in Form-1 of the Rules and also the revised Standard Operating Procedures (SOPs) outlined in this document.

These revised SOPs are modified version of earlier SOPs dated 01/12/2016 and 19/12/2017, Issued consequent to notification of amendments to E-Waste Rules, 2016 vide G.S.R 261 (E) dated 22.03.2018 and also to facilitate easy filing, uniformity in scrutiny and also to maintain transparency. These revised SOPs are in line with the mandate given under E-Waste (Management), Rules, 2016 as amended.

2.0 Format for submission of EPR- Application

A Producer has to apply, providing all information as per Form-1 of E-Waste (Management) Rules, 2016 [Only a Producer can apply- however, Producer may take help from an entity such as PRO. In such cases, covering letter for application and all the declarations have to be on the official letter-head of the Producer]. Application can be submitted by post or courier service. In case of manual submission, application should be deposited only At Dispatch Section located at ground floor of CPCB, Delhi Office.
Information required as per Form-I of E-waste Rules has been simplified in a Format for submitting EPR-Applications As given below;

Format for submitting Application for EPR- Authorization

(As per Form-1 of E-waste Rules)

Part-A (General Information)

1.0 Name and full address along with telephone numbers, E-mail and other contact details of Producer (It should be the place from where sale in entire country is being managed)

2.0 Name of the Authorised Person and full address with E-mail, telephone and fax number

3.0 Name, address And contact details of Producer Responsibility Organisation, if any with full address, e-mail, telephone and fax number, if engaged for implementing the Extended Producer Responsibility.

4.0 Details of electrical and electronic equipment placed in market year-wise for the period equivalent to its average end-of-life as mentioned in the guidelines issued by the Central Pollution Control Board from time to time (as per Table-1)

Part-B (Estimation of E-Waste Generation)

5.0 Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year in the form of Table 2 including those being generated from their service centres, as given below;

Table 2: Estimated generation of Electrical and electronic Equipment waste item-wise and estimated collection target for the forthcoming year

1	2	3		4	
S. No	**Item (EEE with code)**	**Estimated waste electrical and electroni equipment generation MT or Kg**		**Targeted collection In MT or Kg**	
1		YEAR	MT	YEAR	MT
In case of more than one equipment kindly add rows					

Part-C (Extended Producer Responsibility Plan)

6.0 Please provide details of your overall scheme to fulfil Extended Producer Responsibility obligations including targets. This should comprise of general scheme of collection of used/waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier such as through dealers and collection centres, Producer Responsibility Organisation, through buy-back arrangement, exchange Scheme, Deposit refund Scheme, etc. Whether directly or through any authorised agency and channelizing the items so collected to authorised recyclers.

Provide the list with addresses along with Agreement copies with dealers, collection centres, recycler, Treatment Storage and Disposal Facility, etc. under your scheme.
Above information should be submitted as per following format;

6.1 General Scheme of Collection

6.2 Channelization of E-waste and it's flow-chart

6.3 Web-site information

7.0 Estimated budget for Extended Producer Responsibility and allied initiatives to create consumer awareness

8.0 Details of proposed awareness programmes.

Part-D (Reduction of Hazardous Substances)

9.0 Details for Reduction of Hazardous Substances compliance (to be filled if applicable):

9.1 Producer shall provide self-declaration on compliance to RoHS

9.2 Producer should provide another declaration that technical documents on RoHS (as per EN50581) are available with them and will be provided for verification to CPCB/SPCBs officials whenever required.

Part-E (List of Documents)

10.0 Documents required

10.1 EPR plan providing details as required At 6.1 to 6.3

10.2 Copy of permission from the relevant Ministry/Department for selling their product

10.3 Copies of agreement with dealers

10.4 Copies of agreement with collection centres

10.5 Copies of agreement with recyclers/ dismantler

10.6 Copies of agreement with TSDF [In case of CEEW5]

10.7 Copy of DGFT licence/ permission (IEC certificate)

10.8 Self-Declaration on RoHS as per 9.1

10.9 Self- Declaration on RoHS as per 9.2

10.10 Copy of agreement with PRO [if applicable]

Place :
Date : **Authorised Signatory**

3.0 Checklist for evaluation of application

The following check list will be used for evaluation of EPR- application, CPCB will v3rify application as per guidance Table given in Section 4 of this document and shall specify short-comings in remarks column and forward the check-list to Applicants at their registered address. By E-mail and uploaded at web-based application At CPCB website.

Checklist for evolution of Application for EPR- Authorization

S.No.	Details of information required	Provided (Yes/ No)	Remarks
1.0	Name and full address along with telephone numbers, e-mail and other contact details of Producer		
2.0	Name of the Authorised Person and full address with e-mail, telephone and fax number		
3.0	Name, address and contact details of Producer Responsibilit Organisation, if any,		
4.0	Details of electrical and electronic equipment (EEE) placed in market year- wise (As per Table-1)		
5.0	Estimated generation of WEEE		
6.1	EPR-Plan : General Scheme of Collection		
6.2	EPR-Plan: Channelization of E-waste and it's flow-chart		
6.3	EPR-Plan: Web-site information		
7.1	Budget for collection & channelization Schemes and awaren programmes		
8.0	Details of proposed awareness programmes		

9.1	Details for RoHS compliance: Self- declaration on compliance RoHS		
9.2	Details for RoHS compliance: Declaration on possession of technical documents on RoHS (as per EN50581)		
10.1	EPR plan providing details As required at 6.1 to 6.3		
10.2	Copy of permission from the relevant Ministry/ Department for selling their product		
10.3	Copies of agreement with dealers		
10.4	Copy of agreement with collection centres		
10.5	Copies of agreement with recyclers/dismantler		
10.6	Copies of agreement with TSDF [In case of CEEW5]		
10.7	Copy of DGFT licence/ permission (IEC certificate)		
10.8	Self-Declaration on RoHS as per 9.1		
10.9	Self- Declaration on RoHS as per 9.2		
10.10	Copy of agreement with PRO [if applicable]		

4.0 Guidance for Filling Application for EPR-Authorization

The following table will provide guidance to applicants in filling EPR Application.

Table showing guidance for filling Application for EPR- Application Part-A (General Information)

S.No	Information sought as per Form-1	Guidance for providing information
1.0	Name and full address along with telephone numbers, E-mail and other contact details of Producer (It should be the place from where sale in entire country is being managed)	**i.** Provide company name along with postal address, telephone numbers, mobile numbers, E-mail id. **ii.** The Postal address has to be the Address of head office/main office/corporate office which has control over sales in the country and my also of the concerned section which deals with matter related to e-waste rules.
2.0	Name of the Authorised Person and full address with E- mail, telephone and fax number	**i.** Provide name of authorised person along with his full postal address, e-mail id, mobile number, landline number. **ii.** It is always better to have alternate authorised persons and his/her required details.
3.0	Name, address And contact details of Producer Responsibility Organisation, if any with full address, e-mail, telephone and fax number, if engaged for implementing the Extended Producer Responsibility	**i.** Applicable only, if Producer engages a PRO else say 'Not applicable'. **ii.** Only the registered PROs shall be engaged
		i. Applicant has to provide information of only those items, which he/she has been placing on market. For the items not being

4.0	Details of electrical and electronic equipment placed in market year-wise for the period equivalent to its average end-of-life as mentioned in the guidelines issued by the Central Pollution Control Board from time to time (as per Table-1)	sold the applicant has to fill 'Not applicable'/ 'NA'. **ii.** Provide information pertaining to Table-1 of E-Waste Rules as per specimen shown At Annexure-I **iii.** In case the sale records destroyed/lost/untraceable, please an undertaking provided such claims are supported with, where they shall specify the approximate quantity placed on market (Template for affidavit at Annexure-II)
5.0	Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year in the form of Table 2	**i.** Provide information in Table-2 as per specimen shown at Annexure-III

S.No	Information sought as per Form-1	Guidance for providing information
6.0	EPR Plan	Provide information pertaining to 6.1 to 6.3 as described below:
6.1	General Scheme of Collection	**i.** Brief write-up on a scheme for pan India collection of E-waste. This write up shall specify methods envisaged for collection of E-waste from various end users. **ii.** Scheme may include collection centres/ reverse logistic service provider/ courier Service/ PROs/ etc. **iii.** Name, address and contact numbers of all the collection centres/ reverse logistic service provider/ courier Service/ etc. **iv.** Provision of Toll free numbers for consumers to help them in sending their E-waste. The number should be specified in application **v.** A Provide details of Buy-back/ Exchange/ DRS/ Any other Collection Schemes [Optional]
6.2	Channelization of E-waste and it's flow-chart	**i.** Provide write up on movement of E-waste from collection onwards to the premises of authorized dismantler or recycler. **ii.** In case of used florescent lamps, movement from collection centre to TSDF **iii.** Provide a schematic flow chart showing movement of E-wastes at various points starting from collection onwards till it reaches authorized dismantler or recycler.
		i. Website link should be provided in the application along with a screenshot

6.3	Web-site information	that shows the content of E-waste management related details. **ii.** Details of content of related to collection mechanisms of E-waste such As details of all collection schemes **iii.** Toll-free number on Web-page **iv.** Website link has to be on home page at a prominent place on the producer's website.
7.0	Estimated budget for Extended Producer Responsibility and allied initiatives to create consumer awareness	**i.** Provide proposed financial allocation with following breakup; - Awareness programmes - Schemes of Collection - Channelization (including cost of reverse logistic)

S.No	**Information sought as per Form-1**	**Guidance for providing inform**
8.0	Details of proposed awareness programmes	**i.** Details of proposed awareness program the following details shall be given in application; **(a)** Detail of proposed seminars, workshops-: - Targeted Audience-whether it is school, college, institutions, retailers, dealers, bulk consumer's officers, etc. - Frequency of conducting Seminar, Workshops in a Year - Target Metro cities/ small cities/ urban area/ north-east State **(b)** Proposed advertisement in newspapers/ TV/Radio, Pamphlets, booklets **(c)** Logos for recycling of E-waste on Product's Packaging **(d)** Provision of user guide/booklet/Brochures giving details of collection and recycling arrangements made for E-waste.
9.1	Details for RoHS compliance- Producer shall provide self-declaration on compliance to RoHS	Provide a self-declaration as per annexure-IV
9.2	Details for RoHS compliance- Producer should provide another declaration that technical documents	Provide a declaration that technical documents on RoHS (as per EN50581) are available with them and will be provided for verification to CPCB/SPCBs officials whenever required

10.0 [9c]	Document required (9c of Form-1)	
10.1	EPR Plan	Provide details As required at 6.1 to 6.3
10.2	Copy of permission from the relevant Ministry/ Department for selling their product	Provide relevant documents such as incorporation certificate.
10.3	Copies of agreement with dealers	Provide in case dealers are engaged in reverse logistic
10.4	Copy of agreement with collection centres/rev logistic service provider/ Courier Service	Provide relevant copies of agreement
10.5	Copies of agreement with recyclers/dismantle	Provide a copy of agreement with Recyclers/ Dismantlers. In the said agreement, apart from service terms. The agreement shall also specify the following information pertaining to recyclers/ dismantlers. (a)Authorised capacity, (b) validity of authorization, (c) The number of Producers with whom the Recycler has agreement and (d) the total recycling quantity already assured to other Producers.

S.No	Information sought as per Form-1	Guidance for providing information
10.6	Copies of agreement with TSDF [In case of CEEW5]	Provide if applicable
10.7	Copy of DGFT licence/ permission (IEC certificate)	Provide IEC certificate in case the producer is also and importer
10.8	Self-Declaration on RoHS	Provide copy of declaration as specifies at 9.1
10.9	Self- Declaration on RoHS	Provide copy of declaration as specifies at 9.2
10.10	Copy of agreement with PRO [if applicable]	Provide copy of agreement document between registered PRO and Producer in which duties, roles and responsibilities of PRO should be defined.

5.0 Target time and Response

- As stipulated under E-waste Rules, CPCB shall issue EPR- Authorization within 120 days from the date of receipt of complete applications at CPCB, However, CPCB may take much lesser time than 120 days in case the application is complete in all respects.
- CPCB may verify the applications and respond with check-list within 25 days in case of in- complete applications. A letter will be issued along with check-list of short-coming by the concerned officer in CPCB. The check-list will also be uploaded at web based application ay CPCB-website.
- Producers would be given specific time slots to visit office for quarries pertaining to check-list. Such time slots will be mentioned at web based application at CPCB- website.
- Till the time central software is developed, status of applications will be displayed in a dimple web based applications at CPB-Website.

- CPCB may give authorisation based on the individual EPR plan as envisaged by the Producer in their application.

6.0 Approval of EPR- Authorisation

- Chairman, CPCB shall approve the EPR-Plan as scrutinised by concerned official, which is recommended by a committee headed by Member Secretary. Upon approval of CCB the Divisional Head dealing the subject would issue the EPR authorisations.
- In case of renewal of EPR Authorization, Member Secretary, CPCB shall be the approving Authority. Upon approval of MS, the Divisional Head dealing the subject would issue the renewed EPR authorisations.
- In case of amendments in existing EPR Authorization (with respect to typographical errors/ Calculation errors/ change in collection targets/ inclusion or replacement of collection centres/ Recyclers/ Dismantlers/ PROs), Member Secretary, CPCB shall be the approving Authority. Upon approval of MA, the Divisional Head dealing the subject would issue the amended EPR authorisations.

7.0 Refusal of EPR- Authorisation

- As per rule 13 (1) (iii) for the said rules CPCB can refuse EPR authorisation to an applicant. In case, an applicant is not able to provide the requisite details on Quantity placed on market, EPR plan and RoHS Self-declaration, agreement copy with authorized dismantlers/recyclers within 45 days of receipt of letter from CPCB or date of up-dation of status at CPCB web portal and application will be returned by CPCB.
- An opportunity will be given to hear the applicant within one month from the date of return of application (by post or at CPCB web portal), prior to considering the case for refusal of grant of EPR authorisation by CPCB.
- The cases for hearing shall be placed before Chairman, CPCB periodically after taking suitable dates from chairman's office.
- Within 10days after hearing, the dealing official shall place the file with facts/ reasons for recommending refusal for authorization.
- Chairman CPCB will be the final authority for taking decision on refusal.

8.0 Cancellation of EPR- Authorization

- As per rule 13 (1) (iii) for the said rules, CPCB may cancel or suspend EPR authorisation of the Producer, in case a producer failed to comply with any of the conditions of the authorization or with any provisions of the E (P) Act, 1986 or E-waste (Management) Rules, 2016 during the period of authorization. If any producer is found to be violating the provision of authorization, during random checking by CPCB or based on verification by SPCBs, a notice may be issued by CPCB within 25 days.
- An opportunity will be given to hear the Producer within one month from the date of issuance of notice; prior to considering the case for cancellation or suspension of EPR authorisation by CPCB
- The decision on cancellation or suspension of authorization will be intimated within 10days after hearing.

- Chairman CPCB will be the final authority for taking decision on cancellation or suspension.

9.0 Appeal

- Any person aggrieved by an order of suspension or cancellation or refusal of authorisation or its renewal passed by the Central Pollution Control Board may, within a period of thirty days from the date on which the order is communicated to him, prefer an appeal in Form 7 to the Appellate Authority i.e. the Secretary or nominee of Secretary, Ministry of Environment, Forest and Climate Change, Government of India, New Delhi against the order of the Central Pollution Control Board.

Annexure-1

A specimen of filled-up Table-1

S. No.	Electrical and Electronic Equipment Item	EEE Code	Quantity in MT/Kg placed on market (Financial year-wise)									
A	Information technology and telecommunication equipment:											
			Financial Years									
			08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
1	Centralised data processing: Mainframes, Minicomputers	ITEW1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Personal Computing: Laptop Computers (Central Processing Unit with input and output devices)	ITEW3	100 MT	200 MT	300 MT	400 MT	500 MT	600 MT	700 MT	800 MT	900 MT	1000 MT
4	Personal Computing: Notebook Computers	ITEW4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Personal Computing: Notepad Computers	ITEW5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Printer including Cartridges	ITEW6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Copying equipment	ITEW7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Electrical and electronic typewriters	ITEW8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	User terminals an systems	ITEW9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	Facsimile	ITEW10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	Telex	ITEW11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	Telephones	ITEW12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	Pay Telephones	ITEW13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	Cordless telephones	ITEW14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

15	Cellular telephones	ITEW15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	Answering systems	ITEW16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B	**Consumer electrical and electronics:**											
17	Television sets (Including Sets based on (Liquid Crystal Display and light Emitting Diode technology))	CEEW1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	Refrigerator	CEEW2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	Washing Machine	CEEW3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	Air-Conditioners excluding centralised air conditioning plants	CEEW4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	Fluorescent and other Mercury containing lamps	CEEW5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Annexure- II

Template for Affidavit

[Stamp paper of value rupees 100

We_____the Produce r of item codes ----------hereby give sworn affidavit that for sales record for EEE item code -------- have been destroyed / lost/ untraceable [please specify reason] for the period ----------. We also hereby give sworn affidavit that we had ap0proximately placed the following quantities for the period specified;

S. No.	**Item code**	**Year**	**Quantity (Number and weight) placed on Market**	
			Number	**Weight in Kg**

Note: Please add additional row for items code and years

The above quantity may be considered by the Central Pollution Control Board for fixing targets on us for collection and channelization of End-of-life- EEE for the item codes specified above.

We hereby give sworn affidavit that the above information is true to the best of our knowledge

(Authorized Signatory)

Annexure-III

Specimen of filled-up Table-2

1	2	3		4	
S.NO.	**Item (EEE with Code**	**Estimated waste electrical and electronic equipment generation in MT or Kg**		**Targeted collection In MT or Kg**	
1.		**Year**	**MT or Kg**	**Year**	**MT or Kg**
In case of more than on equipment kindly add rows					

Hints for filling up Table-2

Column 2	Applicant has to fill up the type of EEEs with code as mentioned in Table-1 add more rows in case of more than one item of EEE
Column 3	Estimated E-waste generation in the financial year 'x to y'= Sales in the financial year '(x-z) to (y-z)'where z= average life span of EEE Where, financial year 'x to y' is between 'April x to March y' For Example, If generation is to be estimated for ITEW 3 (Laptop Computer), then z=5 years (average life is given in the annexure). The estimated generation of end of life ITEW 3 for the FY 2018-2019= Sales in the (year 2018-5 to 2019-5) in terms of MT or Kg= Sales in the financial year 2013 to 2014 in terms MT or Kg

1	2	3		4	
S.NO.	**Item (EEE with Cod**	**Estimated waste electrical and electronic equipment generation in MT or Kg**		**Targeted collection In MT or Kg**	
1	For Example ITEW 3	**Year**	**MT or Kg**	**Year**	**MT or Kg**
		18-19	600 MT	18-19	120 MT
		19-20	700 MT	19-20	210 MT
		20-21	800 MT	20-21	320 MT
		21-22	900 MT	21-22	360 MT
		22-23	1000 MT	22-23	600 MT
In case of more than on equipment kindly add rows					

Column 4	Applicant should refer schedule III or Schedule III A of the rules as applicable **Case A**- for Producer who are in operation for a period equal to or more than the average life of the product, the Target will be as per schedule III of amended rules and to be filled as per table 2 above

Case-B- for Producer, who has started sales operations recently, i.e. number of years of sales operations is less than average life of their products. The target will be as per Schedule III A and example is given below:

1	2	3		4	
S. No.	**Item (EEE with Code)**	**Sale in the year MT or Kg**		**Targeted collection in MT or Kg**	
1	For Example ITEW 3	**Year**	**MT**	**Year**	**MT**
		16-17	X 1 MT	18-19	0.05 X 1 MT
		17-18	X 2 MT	19-20	0.05 X 2 MT
		18-19	NA	20-21	To be calculated after availability sale figure
		19-20	NA	21-22	To be calculated after availability sale figure
		20-21	NA	22-23	To be calculated after availability sale figure

"SCHEDULE III"

[See rules 5(1) (a) and 13(1) (ii) (xii) (xiv) (xv)]

S. No.	Year	E-waste Collection Target (Weight)
(i)	2017-2018	10 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(ii)	2018-2019	20 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(iii)	2019-2020	30 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(iv)	2020-2021	40 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(v)	2021-2022	50 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(vi)	2022-2023	60 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(vii)	2023 onwards	70 % of quantity of waste generation as indicated in Extended Producer Responsibility Plan.

"SCHEDULE III"

[See rules 5(1) (a) and 13(1) (ii) (xii) (xiv) (xv)]

Extended Producer Responsibility targets for producers, who have started sales operations recently, i.e. number of years of sales operations is less than average life of their products mentioned in the guidelines Issued by Central Pollution Control Board from time to time.

S. No.	Year	E-waste Collection Target (Weight)
(i)	2018-2019	5% of the sales figure of financial year 2016-17
(ii)	2019-2020	5% of the sales figure of financial year 2017-2018
(iii)	2020-2021	10% of the sales figure of financial year 2018-2019
(iv)	2021-2022	10% of the sales figure of financial year 2019-2020
(v)	2022-2023	15% of the sales figure of financial year 2020-2021
(vi)	2023-2024	15% of the sales figure of financial year 2021-2022
(vii)	2024-2025	20% of the sales figure of financial year 2022-2023
(viii)	2025 onwards	20% of the sales figure of the year preceding the previous year.

Annexure- IV
Date:

Self-Declaration Form
(As per E-waste (Management) Rules, 2016)

Producer Details:

S.No.	Required Information	Details
1.	Company Name With Complete Address from where business/sale in the entire country is being managed:	
2	Name of Authorised Person E-mail: Fax: Mobile Number: Complete Postal Address:	
3	Brand name (if any):	

Self- Declaration for Compliance of Reduction in the use of Hazardous Substances (RoHS) (As per E-waste (Management) Rules, 2016)

We_____being the Producer as per E-waste (Management) Rules, 2016, hereby declare that all the EEE, being offered for sale in the country by our company and covered in the Schedule- I of the E-waste (Management) Rules, 2016 and listed at enclosure- A comply with the sub rule (1) of the Rule 16 of the above said Rule.

Authorizing Signatory
(Name/Signature/Seal)

Date:

Enclosed: Enclosure A

Enclosure- A

S. No	Product Category & Code (as per Schedule I of E-waste (M) Rules, 2016)	Product Name	Model No. **	Weight of Product (in Kilograms)	Date of placing on market (In case of import, date of entry in the country)	Compliance with RoHS Yes/No/Partal	RoHS Information provided on provided on product Information booklet Yes/No	In case Product is imported from other country, name of the country where product is manufactured

****Add additional rows for products and models**

Authorizing Signatory
Name/Signature/Seal

Date:

Challenges of implementing the new Rules

The biggest challenge will come from the fact that a large part of our current e-waste management lies in the informal sector. According to the Associated Chambers of Commerce and Industry, only 1.5 per cent of India's total e-waste is recycled by formal recyclers who are approved by state boards. The regulatory structure has so far been unable to tackle this adequately. With micro enterprises given exemption from the e-waste rules, the rules are still silent on the issue.

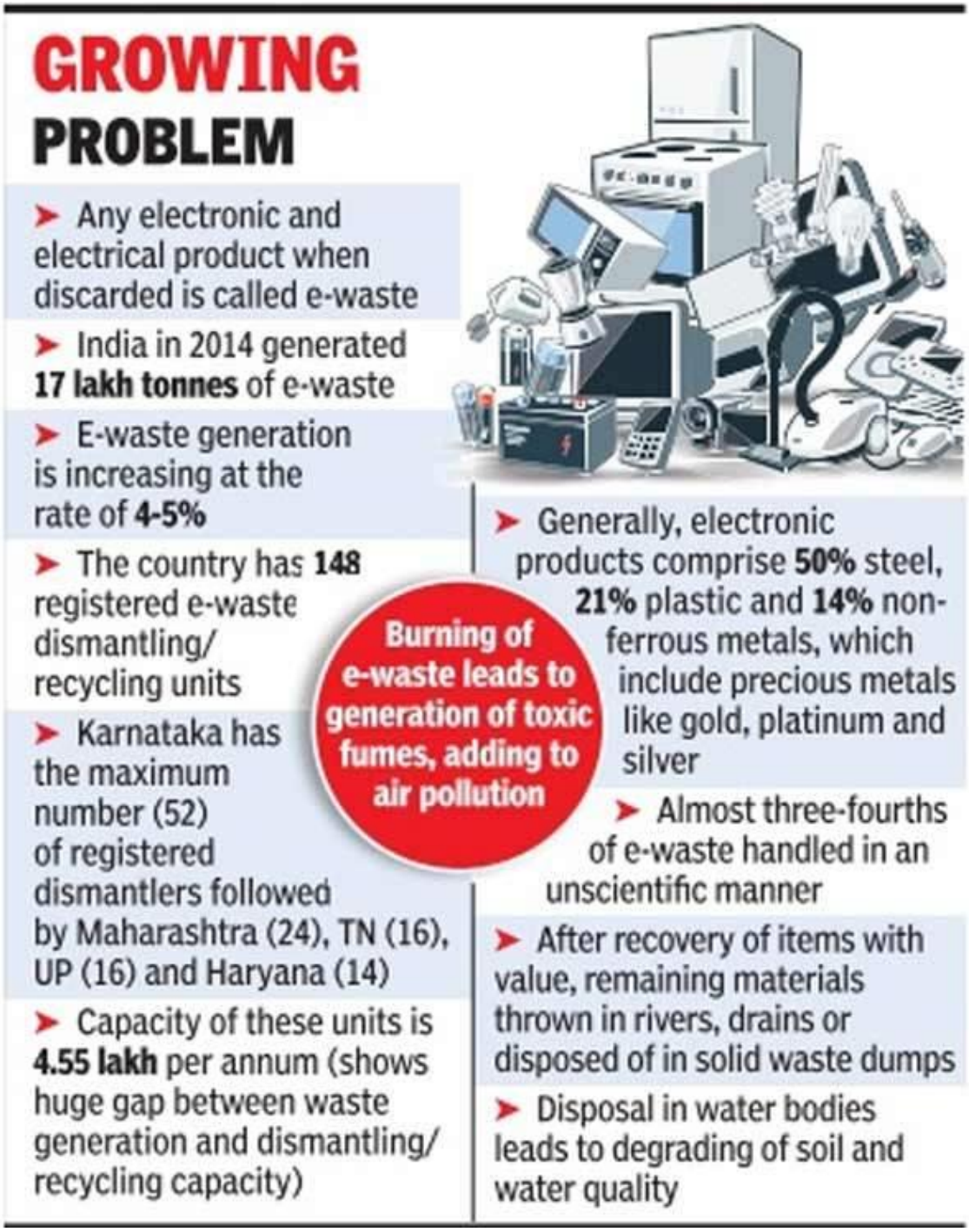


Figure 16: e-Waste the Growing Problem

Source:http://timesofindia.indiatimes.com/home/environment/pollution/Govt-tightens-e-waste-rules-offers-sops-to-consumers/articleshow/51529702.cms

Regulatory architecture is the next big challenge. Both CPCB and SPCBs are understaffed, underfinanced and lack technical capabiliity. A Comptroller and Auditor General (CAG) report has indicted CPCB for inefficient implementation of the e-waste rules, 2011. According to the report, "CPCB did not conduct assessment of quantity of e-waste being generated/processed in the country and effectively coordinate with state agencies for

collection and compliance of such data. The Board also failed to implement framework for reduction of use of hazardous substances in electrical and electronic equipment manufactured and imported in the country." Giving these regulators more responsibility without addressing their human, financial and technical capacity needs would serve little purpose.

Last but not the least, new rules have again failed in making their implementation more consumer-focused. Tools like PRO and DRS can work only when consumers are aware of the hazards of e-waste and are adequately motivated to recycle it through the formal sector.

6. Responsibilities of the manufacturer

Responsibilities of the manufacturer includes–

1) collect e-waste generated during the manufacture of any electrical and electronic equipment and channelise it for recycling or disposal;
2) apply for an authorisation in Form 1 (a) in accordance with the procedureprescribed under sub-rule (2) of rule 13 from the concerned State Pollution Control Board, which shall give the authorisation in accordance with Form 1 (bb);
3) ensure that no damage is caused to the environment during storage andtransportation of e-waste;
4) maintain records of the e-waste generated, handled and disposed in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board;
5) file annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates.

Responsibilities of the producer –
The producer of electrical and electronic equipment listed in Schedule I shall be responsible for -
1) Implementing the Extended Producers Responsibility with the following frameworks, namely:-
(a) collection and channelisation of e-waste generated from the ‘end-of-life’ of their products or ‘end-of-life’ products with same electrical and electronic equipment code and historical waste available on the date from which these rules come into force as per Schedule I in line with the targets prescribed in Schedule III in

Extended Producer Responsibility - Authorisation;
(b) the mechanism used for channelisation of e-waste from ‘end-of-life’ products including those from their service centres to authorised dismantler or recycler shallbe in accordance with the Extended Producer Responsibility - Authorisation. Incases of fluorescent and other mercury containing lamps, where recyclers are not available, channelisation may be from collection centre to Treatment, Storage and

Disposal Facility;
(c) for disposal in Treatment, Storage and Disposal Facility, a pre-treatment is necessary to immobilise the mercury and reduce the volume of waste to be disposed off;

(d) Extended Producer Responsibility - Authorisation should comprise of generals cheme for collection of waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier, such as through dealer, collection centres, producer Responsibility Organisation, through buy-back arrangement, exchange scheme, Deposit Refund System, etc. whether directly or through any authorised agency and channelising the items so collected to authorised recyclers;

(e) providing contact details such as address, e-mail address, toll-free telephone numbers or helpline numbers to consumer(s) or bulk consumer(s) through their website and product user documentation so as to facilitate return of end-of-life electrical and electronic equipment;

(f) creating awareness through media, publications, advertisements, posters, or by any other means of communication and product user documentation accompanying the equipment, with regard to -

i. information on address, e-mail address, toll-free telephone numbers or helpline numbers and web site;

ii. information on hazardous constituents as specified in sub-rule 1 of rule 16 in electrical and electronic equipment;

iii. information on hazards of improper handling, disposal, accidental breakage, damage or improper recycling of e-waste;

iv. instructions for handling and disposal of the equipment after its use, along with the Do's and Don'ts;

v. affixing a visible, legible and indelible symbol given below on the products or product user documentation to prevent e-waste from being dropped in garbage bins containing waste destined for disposal;

vi. means and mechanism available for their consumers to return e-waste for recycling including the details of Deposit Refund Scheme, if applicable;

(g) the producer shall opt to implement Extended Producer Responsibility individually or collectively. In individual producer responsibility, producer may set up his own collection centre or implement take back system or both to meet Extended

Producer Responsibility.

In collective system, producers may tie-up as a member with a Producer Responsibility Organisation or with e-waste exchange or both. It shall be mandatory upon on the individual producer in every case to seek

Extended Producer Responsibility –
Authorisation from Central Pollution Control
Board in accordance with the Form-1 and the procedure laid down in sub-rule (1)
of rule 13;

(2) to provide information on the implementation of Deposit Refund Scheme to ensure collection of end-of-life products and their channelisation to authorised dismantlers or recyclers, if such scheme is included in the Extended Producer Responsibility Plan.
Provided that the producer shall refund the deposit amount that has been taken from the consumer or bulk consumer at the time of sale, along with interest at the prevalent rate for the period of the deposit at the time of take back of the end-of life product;

(3) the import of electrical and electronic equipment shall be allowed only to producers having Extended Producer Responsibility authorisation;

(4) maintaining records in Form-2 of the e-waste handled and make such records available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;

(5) filing annual returns in Form-3, to the Central Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. In case of the Producer with multiple offices in a State, one annual return combining information from all the offices shall be filed;

(6) the Producer shall apply to the Central Pollution Control Board for authorisation in Form 1, which shall thereafter grant the Extended Producer Responsibility -Authorisation in Form 1(aa).

(7) Operation without Extended Producer Responsibility-Authorisation by any producer, as defined in this rule, shall be considered as causing damage to the environment.

Reduction in the use of hazardous substances in the manufacture of electrical and electronic equipment and their components or consumables or parts or spares. – Every producer of electrical and electronic equipment and their components or consumables or parts or spares listed in Schedule I shall ensure that, new Electrical and Electronic Equipment and their components or consumables or parts or spares do not contain Lead, Mercury, Cadmium, Hexavalent Chromium, polybrominated biphenyls and polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury,hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethersand of 0.01% by weight in homogenous materials for cadmium.

SCHEDULE I

[See rules 2, 3(j), 3(y), 3(aa) and 3(ff); 5; 9; 11(10); 13 (1) (i), 13 (1) (vii) and 16(1), 16(11)]

Categories of electrical and electronic equipment including their components, consumables, parts and spares covered under the rules

Sr. No.	Categories of electrical and electronic equipment	Electrical and electronic equipment code
i.	**Information technology and telecommunication equipment :**	
	Centralised data processing: Mainframes, Minicomputers	ITEW1
	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2
	Personal Computing: Laptop Computers(Central Processing Unit with input and output devices)	ITEW3
	Personal Computing: Notebook Computers	ITEW4
	Personal Computing: Notepad Computers	ITEW5
	Printers including cartridges	ITEW6
	Copying equipment	ITEW7
	Electrical and electronic typewriters	ITEW8
	User terminals and systems	ITEW9
	Facsimile	ITEW10
	Telex	ITEW11
	Telephones	ITEW12
	Pay telephones	ITEW13
	Cordless telephones	ITEW14
	Cellular telephones	ITEW15
	Answering systems	ITEW16
ii.	**Consumer electrical and electronics:**	
	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1
	Refrigerator	CEEW2
	Washing Machine	CEEW3
	Air-conditioners excluding centralised air conditioning plants	CEEW4
	Fluorescent and other Mercury containing lamps	CEEW5

Table 5: Categories of electrical and electronic equipment with their code as defined in New Rule 2016

FORM-1

[See Rules 5(1) (g), 13(1) (i), 13(1) (vi)]

Applicable to producers seeking Extended Producer Responsibility - Authorisation

The application form should contain the following information:

1.	Name and full address along with telephone numbers, e-mail and other contact details of Producer (It should be the place from where sale in entire country is being managed)	:	
2.	Name of the Authorised Person and full address with e-mail, telephone and fax number	:	
3.	Name, address and contact details of Producer Responsibility Organisation, if any with full address, e-mail, telephone and fax number, if engaged for implementing the Extended Producer Responsibility	:	
4.	Details of electrical and electronic equipment placed on market year-wise during previous 10 years in the form of Table 1 as given below:	:	

Table 1: Details of Electrical and Electronic Equipment placed on the market in previous years - Code wise

Sr. No.	Electrical and Electronic Equipment Item	Electrical and Electronic Equipment Code	Quantity, number and weight placed on market (year-wise)									
A	**Information technology and telecommunication equipment:**											
1	Centralised data processing: Mainframes, Minicomputers	ITEW1										
2	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2										
3	Personal Computing: Laptop Computers(Central Processing Unit with input and	ITEW3										

	output devices)											
4	Personal Computing: Notebook Computers	ITEW4										
5	Personal Computing: Notepad Computers	ITEW5										
6	Printers including cartridges	ITEW6										
7	Copying equipment	ITEW7										
8	Electrical and electronic typewriters	ITEW8										
9	User terminals and systems	ITEW9										
10	Facsimile	ITEW10										
11	Telex	ITEW11										
12	Telephones	ITEW12										
13	Pay telephones	ITEW13										
14	Cordless telephones	ITEW14										
15	Cellular telephones	ITEW15										
16	Answering systems	ITEW16										
B	**Consumer electrical and electronics:**											
17	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1										
18	Refrigerator	CEEW2										
19	Washing Machine	CEEW3										
20	Air-conditioners excluding centralised air conditioning plants	CEEW4										
21	Fluorescent and other Mercury containing lamps	CEEW5										

5. Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year in the form of Table 2 including those being generated from their service centres, as given below:

Table 2: Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year

Sr. No.	Item	Estimated waste electrical and electronic equipment generation Number and weight	Targeted collection Number and weight

6. Extended Producer Responsibility Plans:

(a) Please provide details of your overall scheme to fulfil Extended Producer Responsibility obligations including targets. This should comprise of general scheme of collection of used/waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier such as through dealers and collection centres, Producer Responsibility Organisation, through buy-back arrangement, exchange scheme, Deposit Refund Scheme, etc. whether directly or through any authorised agency and channelising the items so collected to authorised recyclers.

(b) Provide the list with addresses along with agreement copies with dealers, collection centres, recyclers, Treatment, Storage and Disposal Facility, etc. under your scheme.

7. Estimated budget for Extended Producer Responsibility and allied initiatives to create consumer awareness.

8. Details of proposed awareness programmes.

9. Details for Reduction of Hazardous Substances compliance (to be filled if applicable):

(a) Whether the Electrical and Electronic Equipment placed on market complies with the rule 16 (1) limits with respect to lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominateddiphenyl ethers;

(b)Provide the technical documents (Supplier declarations, Materials declarations/Analytical reports) as evidence that the Reduction of Hazardous Substances (RoHS) provisions are complied by the product based on standard EN 50581 of EU;

(c) Documents required:

i. Extended Producer Responsibility plan;
ii. Copy of the permission from the relevant Ministry/Department for selling their product;

FORM 1(bb)

[See rules 4(2), 8(2)(a), 13(2) (iii) and 13(4)(ii)]

FORMAT FOR GRANTING AUTHORISATION FOR GENERATION OR STORAGE OR TREATMENT OR REFURBISHING OR DISPOSAL OF E-WASTE BY MANUFACTURER OR REFURBISHER

Ref: Your application for Grant of Authorisation

1. (a) Authorisation no. ..... and (b) date of issue .....

2. .....of.....is hereby granted an authorisation for generation, storage, treatment, disposal of e-waste on the premises situated at..... for the following:
   a. quantity of e-waste;
   b. nature of e-waste.

3. The authorisation shall be valid for a period from ..... to .....

4. The e-waste mentioned above shall be treated/ disposed off in a manner ..... at .....

5. The authorisation is subject to the conditions stated below and such conditions as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.

Signature ----------
Designation ---------- Date: ----------

Terms and conditions of authorisation

1. The authorisation shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made thereunder.
2. The authorisation or its renewal shall be produced for inspection at the request of an officer authorized by the concerned State Pollution Control Board.
3. Any unauthorised change in personnel, equipment as working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorisation.
4. It is the duty of the authorised person to take prior permission of the concerned State Pollution Control Board to close down the operations.
5. An application for the renewal of an authorisation shall be made as laid down in sub-rule (vi) of rule 13(2).

FORM-2

[See rules 4(4), 5(4), 6(5), 8(7), 9(2), 10(7), 11(8), 13 (1) (xi), 13(2)(v), 13(3)(vii) ar 13 (4)(v)]

FORM FOR MAINTAINING RECORDS OF E-WASTE HANDLED OR GENERATI

Generated Quantity in Metric Tonnes (MT) per year

1.	Name & Address: Producer or Manufacturer or Refurbisher or Dismantler or Recycler or Bulk Consumer*		
2.	Date of Issue of Extended Producer Responsibility Authorisation*/ Authorisation*		
3.	Validity of Extended Producer Responsibility Authorisation*/ Authorisation*		
4.	Types & Quantity of e-waste handled or generated**	Category	Quantity
		Item Description	
5.	Types & Quantity of e-waste stored	Category	Quantity
		Item Description	
6.	Types & Quantity of e-waste sent to collection centre authorised by producer/ dismantler/recycler / refurbisher or authorised dismantler/recycler or refurbisher**	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 e-waste sent to recyclers by dismantlers	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		
12.	Types & Quantity of other waste sent to respective recyclers by dismantlers/recyclers of e-waste	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		
13.	Types & Quantity of e-waste treated & disposed	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		

Note:-

(1) * Strike off whichever is not applicable

(2) Provide any other information as stipulated in the conditions to the authoriser

(3) ** For producers this information has to be provided state-wise

FORM-3

[See rules 4(5), 5(5), 8(6), 9(4), 10(8), 11(9), 13 (1) (xi), 13(2)(v), 13(3)(vii) and 13(4)(v)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted by producer or manufacturer or refurbisher or dismantler or recycler by 30th day of June following the financial year to which that return relates].

Quantity in Metric Tonnes (MT) and numbers

1	Name and address of the producer or manufacturer or refurbisher or dismantler or recycler			
2	Name of the authorised person and complete address with telephone and fax numbers and e-mail address			
3	Total quantity of e-waste collected or channelised to recyclers or dismantlers for processing during the year for each category of electrical and electronic equipment listed in the Schedule I (Attach list) by PRODUCERS			
	Details of the above	TYPE	QUANTITY	No.
3(A)*	BULK CONSUMERS: Quantity of e-waste			
3(B)*	REFURBISHERS: Quantity of e-waste:			
3(C)*	DISMANTLERS: i Quantity of e-waste processed (Code wise); ii. Details of materials or components recovered and sold; iii. Quantity of e-waste sent to recycler; iv. Residual quantity of e-waste sent to Treatment, Storage and Disposal Facility.			
3(D)*	RECYCLERS: i. Quantity of e-waste processed (Code wise); ii. Details of materials recovered and sold in the market; iii. Details of residue sent to Treatment, Storage and Disposal Facility.			
4	Name and full address of the destination with respect to 3(A)-3(D) above			
5	Type and quantity of materials segregated or recovered from e-waste of different codes as applicable to 3(A)-3(D)	Type	Quantity	

✔Enclose the list of recyclers to whom e-waste have been sent for recycling.

Place_____

7. Building blocks to an internal policy on e-waste management

To comply with the India e-waste rule 2016, companies need to work on their only policy framework to ensure the compliance of its products to these new initiatives and directives. Companies need to prohibits use of lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers in concentrations exceeding 0.1 weight % and 0.01 weight % for cadmium, except for the exemptions set in Schedule 2 of the Rule. Along with the manufacturing, policy should address the collection and return of End of Life products.

The elements of a framework are

- Policy
- Implementation
- Monitoring
- Reporting

Policy:

It should address the following

- Are we consistent with the rules and regulations of the land?
- Does the organization currently have an e-waste disposal policy?
- Does the disposal policy take environmental considerations into account?
- Can we do more than only fulfilling legal objectives?

Implementing the policy
While implementing the policy we should consider the following

- Do we have structures in place for implementing the policy?
- How do we organize collection, storage and disposal?
- Are the service provider recognized and contracts signed?

Monitoring
How do we monitor the progress of our implementation process?
Is there a monitoring system in place?

What are the elements of a monitoring system?
Indicators and Targets?

An Example: UBA

UBA Facts

- Founded in 1974, the UBA is Germany's central federal authority on environmental matters. Its key statutory mandates are:
    - To provide scientific support to the Federal Government (e.g.. the Federal Ministries for Environment; Health; Research; Transport, Building and Urban Affairs);

    - Implementation of environmental laws (e.g. emissions trading, authorisation of chemicals, pharmaceuticals, and plant protection agents)
- Total staff of around 1,400
- Some 900 of UBA's total staff work in the UBA headquarter in Dessau-Roßlau
- Altogether the staff is dispersed over 13 sites
- Eco-Management and Audit Scheme (EMAS) certification conducted at 5 sites representing more than 85 percent of total staff
- Annual inspection of EMAS certified sites by independent consultant

UBA Environmental Guidelines

In the Federal Environment Agency mission statement its staff's objectives are to:

- protect and maintain natural resources,
- promote sustainable development and
- to firmly root environmental protection as a matter of course in everyone's thinking and actions.

UBA pursue these goals especially within their Agency and resolutely practice what they recommend to others for the promotion of long-term, environmentally compatible development. They implement an environmental management system which heir environmental guidelines provide the basis for.

How they see ourselves

- It is especially in the fulfillment of its professional tasks that the Federal Environment Agency contributes to environmental protection. They adhere to the environmental protection legislation in force and commit ourselves beyond that to continuous improvement of environmental protection in our own activities by setting concrete environmental targets, and we regularly check our performance. When doing so, they take the possibly undesired environmental impacts of our products and services into consideration.
- The Agency promotes a sense of responsibility and the active involvement of all its staff in efforts to protect the environment and health.

To reduce negative environmental impacts

- In procurement, UBA prefer the most environmentally compatible products in light of their manufacture, use, and disposal.
- UBA use energy, water, materials, and space efficiently and in an environmentally compatible fashion.
- They make efforts to avoid waste and where waste is unavoidable, It is recycled or disposed of in an environmentally compatible way.
- Their business trips are conducted in as an environmentally compatible manner as possible. They recommend their visitors to use public transport.
- UBA involve their contractors in their activities to protect the environment and health.

To promote transparency they regularly conduct in-house environmental checks, make their results public, and the derived measures are stated in an environmental impact report which then exposes us to public discussion.

UBA E-Waste Practices

- Compliance with e-waste legislation (ElektroG)
- Central collection of e-waste at each site
- Contracts with local recyclers for the recycling of e-waste (e.g. Remondis, Recycling firm of the city of Dessau)

- Annual pickup of e-waste by authorized recycler or delivery to recyler
- Some EEE is sold (e.g. to Vebeg) for reuse purposes
- Environmental audits of internal e-waste streams by Environmental Protection Officer

Partner Organizations

Recyler, e.g. Remondis

- Remondis is the largest German recyling company
- Remondis recycles the WEEE according to the applying legal requirements (ElektroG)

Reuse Seller – VEBEG

- VEBEG is a Trust Company of the Federal Republic of Germany, was established in 1951 by the Federal Ministry of Finance
- VEBEG sells equipment from boots to aircraft and from vehicles to old EEE
- Annually VEBEG sells some 30,000 lots through tenders

UBA Annual Environmental Reports

Report contains data on e-waste quantities at site in Dessau

Tabelle 5: Entwicklung des Aufkommens an Abfällen im Dienstgebäude Dessau-Roßlau

Abfallbezeichnung	ASN	2006	2007	2008	2009
Fettabscheider (Kantine) (in m³)	020204	-	12	12	12
Gemischte Verpackungen (DSD, in m³)	150106	13	11,88	85,8	85,8
Papier und Pappe/Karton (in m³)	200101	120	197	36 + 28,6 t	311 + 25 t
Altglas (in m³)	150107	40	40	85,8	85,8
Disketten (CD, DVD, in kg)	200139		14	153	18
Bioabfälle (in m³)	200108	6	2,2	14,5	19,4
Haushaltsbatterien (in kg)	200133	Gewicht nicht erfasst			120
Hausmüllähnliche Abfälle (in m³)	200301	400	300	338	336
Sperrmüll (in m³)	200307				3,5
Elektrische Geräte (in kg)	160214	-	1058	307	13 Geräte
Grünschnitt/Laub (in m³)	200201	-	-	0,36	0,24

WEEE in kg (in units for 2009)

Table 6: e-waste quantities at site in Dessau

Report contains data on e-waste quantities at site in Berlin

Tabelle 6: Entwicklung des Aufkommens an nicht gefährlichen Abfällen in Berlin-Bismarckplatz

Abfallbezeichnung	ASN	2005	2006	2007	2008	2009	1. Halbj. 2010
Fettabscheider (Kantine, in m³)	020204	8	8	8	8	8	8
gemischte Verpackungen (DSD, in m³)	150106	63	63	63	121	121	
Papier und Pappe (in m³)	200101	108	72	72	55	72	18
Altglas (in m³)	150107	29	29	29	29	29	
Disketten (CD, DVD, in kg)	200139	15	15	5	101	96	59
Bioabfälle (in m³)	200108	12	12	12		12	
Haushaltsbatterien (in kg)**	200133	0,3 m³		4			
Hausmüllähnliche Abfälle (in m³)	200301		38,1 t	21	343	363	343
Sperrmüll (in kg)	200307	95 m³	17.130	-	3.000		
Gebrauchte elektrische Geräte (in kg)	160214	363	1.667	-	2.244	1.308	
						7.500	

mpostierung)

WEEE in kg

Table 7: e-waste quantities at site in Berlin

8.Guidelines for setting up of collection centres of e-waste:

Criteria for setting up Collection centres

1. The collection, transportation, storage and handling of E-Waste in the collection centres as to be done carefully without breaking the end of life equipment.

2. Collection centers, established under these Rules, need not seek Consent to Establish and Consent to Operate under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981. Ensure that no damage is caused to the environment during storage and transportation of e-waste;

3. Producers having large number of distributors/dealers in each of the State and has large warehouses already in place can use the space if available in these ware house for establishing collection centre. However, the space used for collection centre has to be clearly demarcated (by enclosure or partition) from the space meant for new goods.

4. The storage capacity of any collection centre should be commensurate with available area,volume of operations (in weight) and type of E-waste.

5. The collection centre where Refrigerator and Air conditioners are also stored should have adequate facilities for handling / arresting leakage of compressor oils, CFCs/HCFCs if any.

6. Covered shed/spaces may be used for storage of E-Waste generated from IT and Telecommunication equipments while open spaces can be used for storage of refrigerators /washing machines /air conditioners. In case of storage of e-waste, generated from IT and Telecommunication equipment, in open spaces, containers with lids/covers may be used. Ewaste comprising of IT & TE waste preferably be segregated and stored at collection centre in suitable racks/containers/bins.

7. Containers of appropriate size and shape may be used for segregation of e-waste items generated from IT and Telecommunication equipments to facilitate effective collection and handling operations. Containers can be made either of wood or plastic or mild steel or any appropriate material with sufficient strength and shapes (top open containers, caged boxes, rakes etc.) for holding the e-waste. These containers/racks may be placed in such a way that there should be adequate space for movement of workers and material.

8. Producer can assess their individual requirements and design a collection or product take back systems as they deem appropriate as long as it facilitates channelization of WEEE for environmentally sound management.

Legal Requirement of Collection Center

The collection centre has to comply with following legal requirements:

- To obtain an authorization from the concerned SPCBs/PCCs
- To ensure that the e-waste collected by them is sent to registered dismantlers or recyclers in a secured manner.
- Maintain records in Form-2 of the e-waste handled as per the guidelines of Central Pollution Control Board and make such records available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board as and when asked for.
- To file annual returns in Form 3
- To make the records available for scrutiny by the SPCBs/PCCs

Figure 17: Mumbai gets its 1st e-waste collection centre

9.How do you set up of a Producer Responsibility Organization (PRO) for collecting e-waste:

Steps for Setting Up a PRO by GIZ-IGEP:

Define Framework

- Accountability Framework : It will address the elements and processes of the PRO to account for its actions to stakeholders, members, management
- Operational Framework: Detailing the management processes and systems supporting day-to-day activities and the overall accountability framework
- Identify Stakeholders: Identify both external and internal stakeholders for this PRO

A single framework that will eliminate confusion between the components and to easily identify linkages between common accountability and operational elements. This will also communicate roles and responsibilities, design and deliver programmes, establish M& E, MIS and strategies

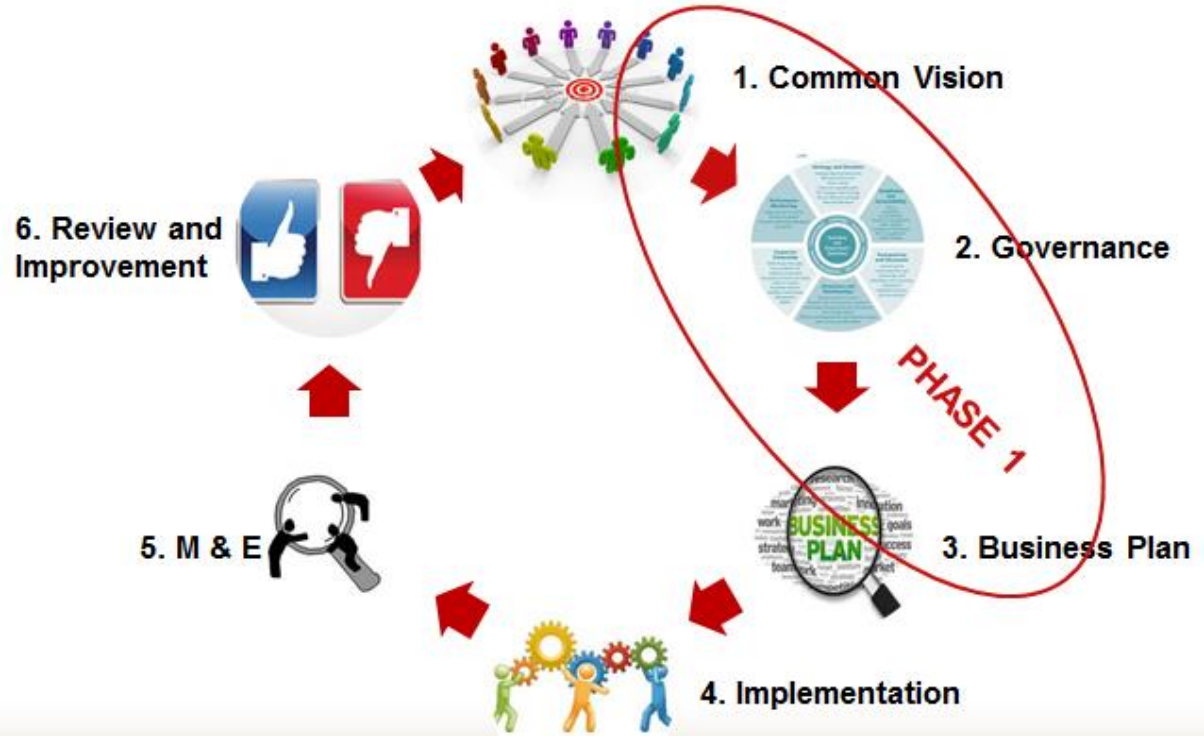


Figure 18: Steps involve in developing the framework

1. Common Vision

Establish Commitment & Common vision

a) Identify stakeholders and establish commitment and common vision
   - through consultation and collaboration
   - define objectives and functions of the PRO

- Facilitates building trust amongst stakeholders by addressing their issues, concerns, ideas, values and areas of mutual importance.

b) Determine stable and long term revenue stream and financial mechanism linked to the objective.
c) Address issues of trade and competition and degrees of tolerance of free riding.

2. Governance

Facilitate development of the overall governance structure.

1. Establish board of directors (BoD) – representing a variety of skills and perspectives to fulfill the PRO's mandate and meeting its environmental priorities, goals and objectives
2. A regulation or MoU will be drafted defining performance targets, consequences of companies failing to comply, credible monitoring verification systems, legal requirements and potential liability of board members
3. Composition, term of office, roles and responsibilities, policies, code of conduct, conflict of interest, confidentiality and investment policy, meeting schedules of the Board will be defined
4. Support the board to establish committees – SC or Ad hoc Committees like Audit, investment or executive committees.

3. Business Plan

Develop and propose the business plan of the PRO providing day-to-day direction to management and staff :

1. Describing essential components of the business involved in ESM of e-waste
2. Client definition will be elaborated to focus programs and strategies on those clients that the PRO provides services to
3. Develop Procedures and detailed method for environmental and SWOT analysis of the PRO
4. Develop Business strategy in maximising the collection of e-waste and revisit regularly to improve on it and outcomes over short term, medium term and long term shall be elaborated in terms of recycling rates and volumes recycled
5. Development of performance measurement criteria such as SMART targets, timelines, indicators, feedback
6. Resource planning will be an essential step in the Business plan – human, financial, infrastructural, etc.

4. Implementation

Phase 1: A study will be carried out to define governance structure, scope, geographical spread, functional form, legal structure and business model of the proposed PRO

Implementation will take place at 2 levels

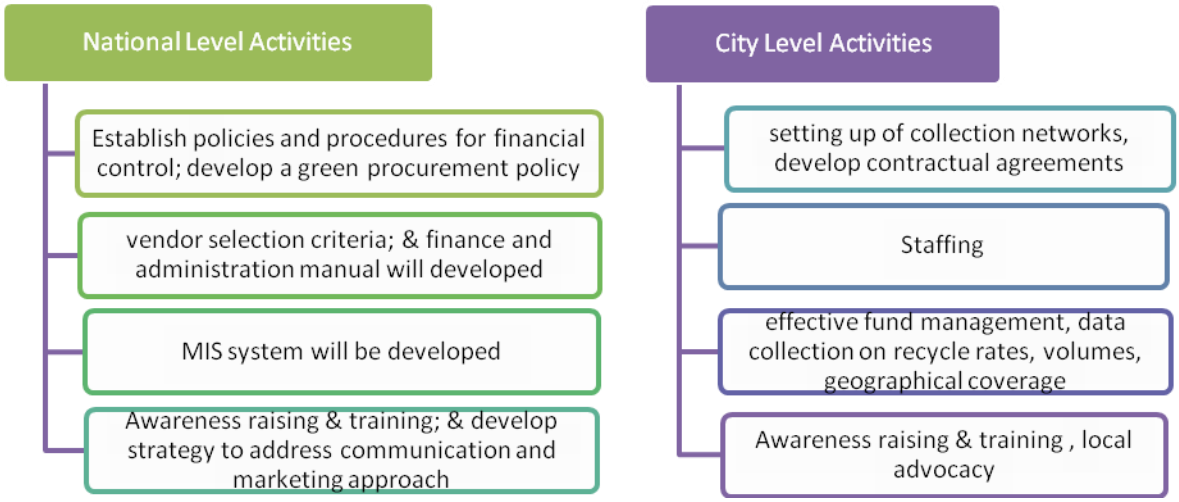


Figure 19: National level and city level activities of a PRO

5. Monitoring & Evaluation

- Frequency of Monitoring will be decided
- Annual reports will be generated as a good business practice to keep stakeholders informed of the PRO's activities
- Independent audit verification of results will be done

6. Review and Improvement

- MIS developed will be referred in order to assess the progress in terms of ESM of e-waste
- Steps to improve the penetration and the strategy will be regularly taken to ensure meeting the objectives of the PRO

Implementation of the PRO

Define Processes

- Process Landscape
- Process Hierarchy
- National level implementation

Process Landscape for PRO Implementation

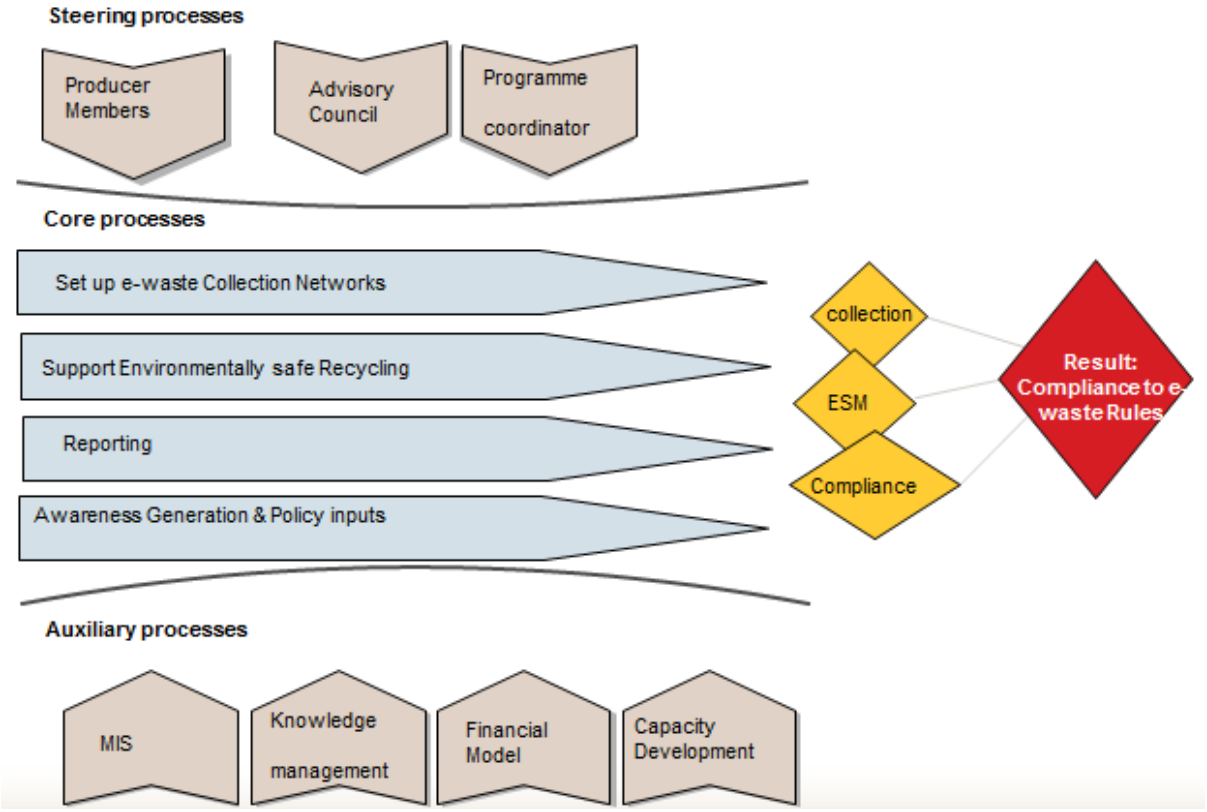


Figure 20: Process landscape for PRO Implementation

Process Hierarchies

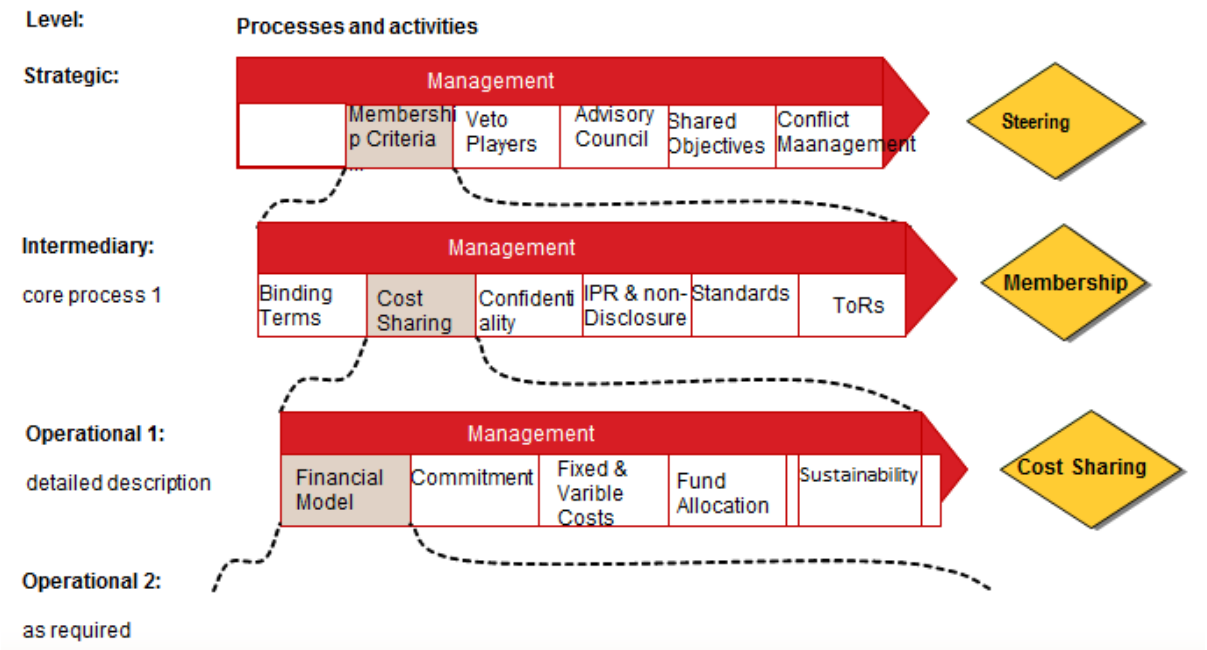
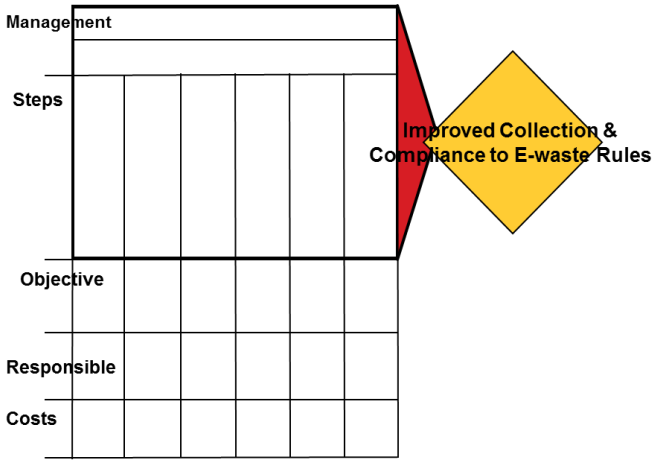


Figure 21: Process Hierarchies for PRO Implementation

National level Implementation: Phase II

- Phase I would cover three steps viz. Visioning, Governance and Business plan;
- In Phase II, the programme would cover steps like developing implementation plan and process landscape, fund allocation, capacity development, project set up in Cities;
- Staffing and vendor selection criteria and finance and administration manual to be developed
- MIS to evaluate effective fund management in a fiscally responsible manner, recycle rates, volumes, geographical coverage

Baseline Study design



Objective: To define governance structure, scope, geographical spread, functional form, legal structure and business model of the proposed PRO

The study shall define steps in establishing Common vision and commitmentBoard of Directors; & roles and responsibilitiesLegal requirements, potential liability and contractual agreements, MIS

Table 8: Baseline Study design format

developmentVendor selection criteria; collection networks, awareness raising, advocacy, Communication and marketing approach

Develop Architecture of intervention

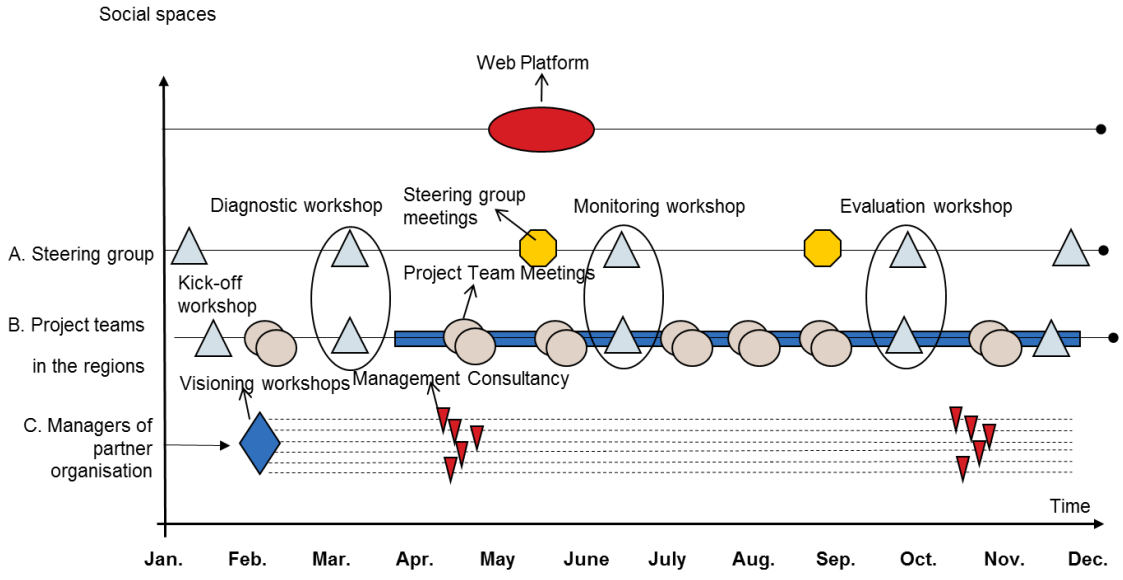


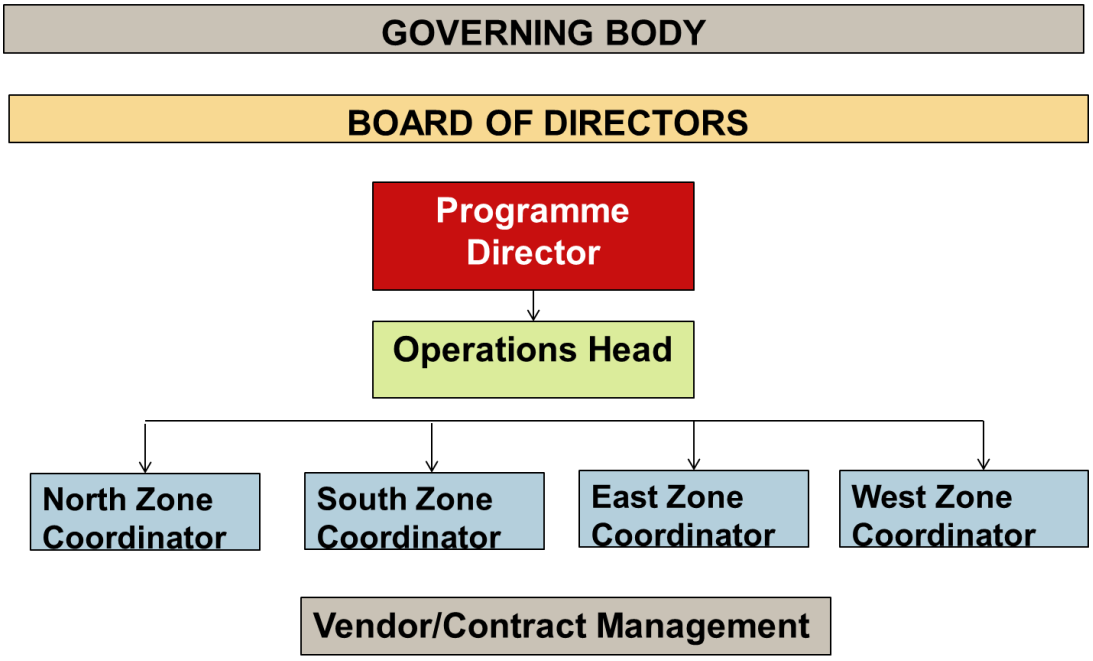
Figure 22: Timeframe PRO Implementation

City Level implementation

Objective:

- Maximize collection of E-waste for compliance to E-waste (M&H) Rules
- Periodic and gradual increase in collection volume over a span of 1 year across the target cities
- Indicators for cities based on their segregation into Tier I and Tier II
- Monitoring and Evaluation
- Review and improvement

Organizational Structure



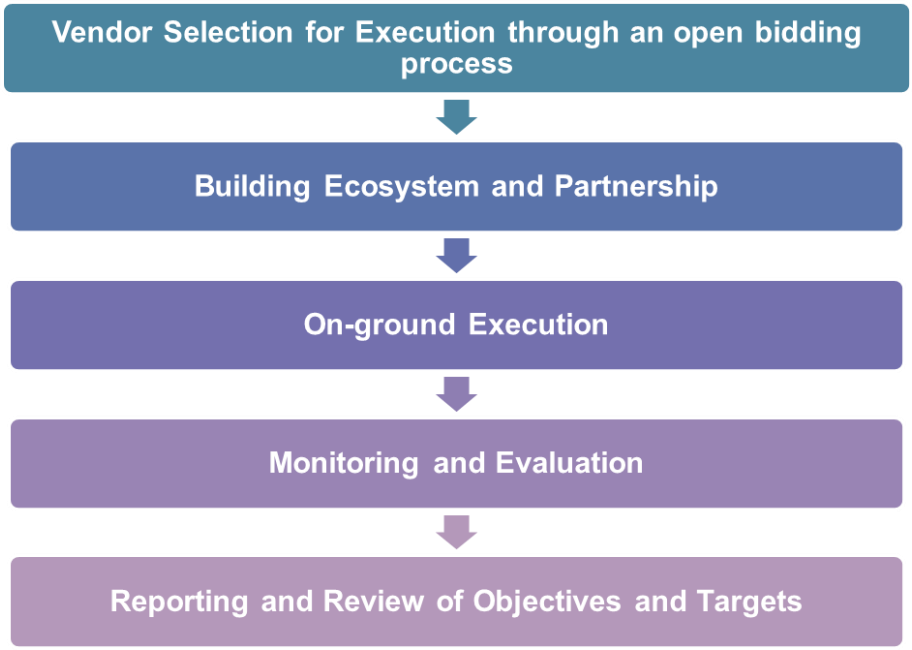
RESOURCEs/ organizational structure

- The PRO would comprise of 1 Programme Director and three Programme Coordinators with a governing body and board of directors at the top level.
- All the cities would be divided into zones i.e. North, South, East and West
- One resource would be exclusively involved in handling he Vendor/Contract Management system for all cities

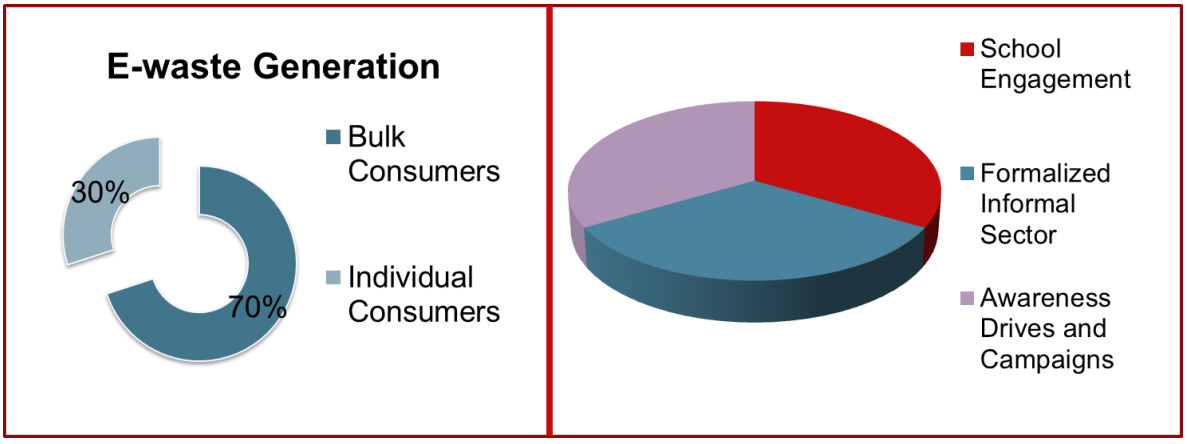
Resource Person	Costs (figure in INR) per month
Programme Director	2,50,000
Operations Head	1,50,000
Zonal Coordinators (* 4)	75,000 – 1,00,000
Vendor Management System	70,000
Total	68,40,000

CITY-LEVEL PROCESS

- An eco-system would be built at the city level involving all stake-holders in the value chain. This would be essential for sustainability of the program.
- The city level implementation for each component would be given out to vendors through a bidding process



CHANNELS FOR ENGAGEMENT: COMPONENTS



Vendor Costs Associated with the stated components Per city Per Year would be the following (Figures in INR based on experience from older projects)

School Engagement : 17,00,000

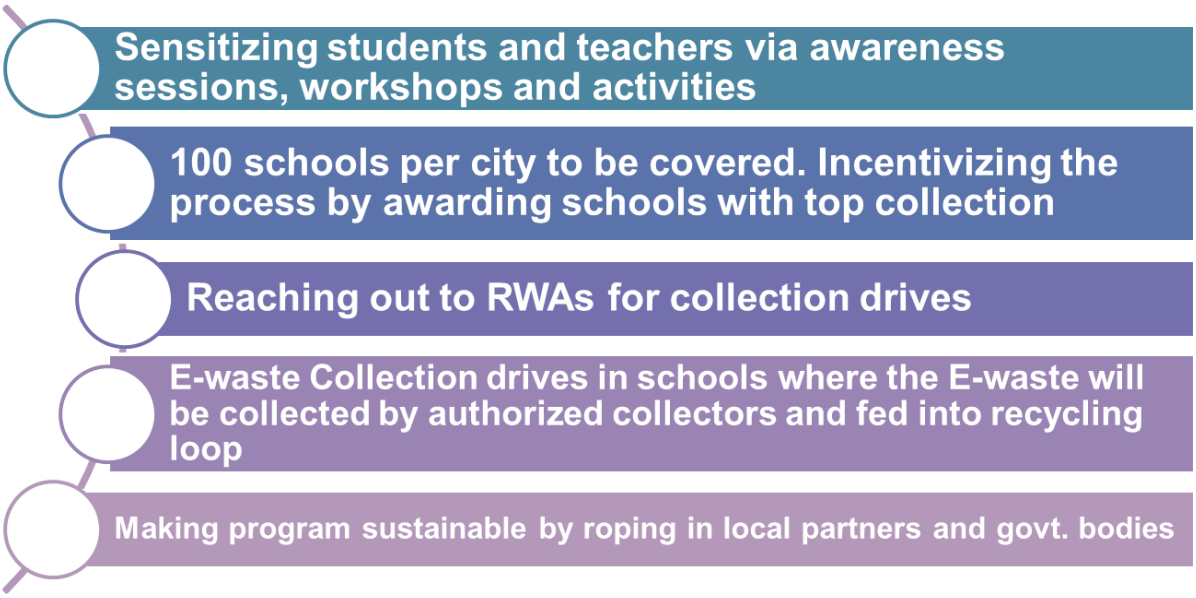
Informal Sector: 13,00,000 - 17,00,000 (the cost may vary depending on prior presence and existing informal sector engagement in the target city)

City Level Awareness Drives (2 in a year): 4,00,000 (Partnering Media Entity and other organizations being partnered with would contribute to this)

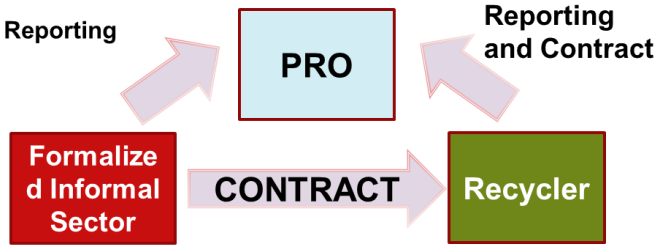
Total 38,00,000

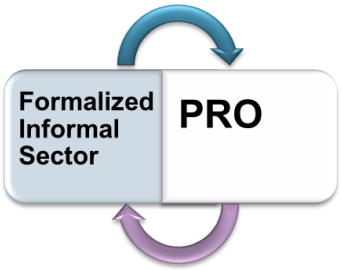
SCHOOL & community COMPONENT

- Students and youth are the drivers of consumerism these days and major Consumers of Electronic Waste
- Schools have proven to be good channels for engagement and collection



Informal Sector engagement





- Involving the informal sector will feed into the loop of the PRO and help plug the leakages in the existing chain
- Contracts would be facilitated between the Formalized informal sector and recycler to which a contract has been issued by the PRO
- The formalized informal sector group would be more involved in reaching out to individual consumer segment and smaller companies
- Training to be provided to formalized informal sector groups
- Both Parties to provide data/reports to be fed into MIS system

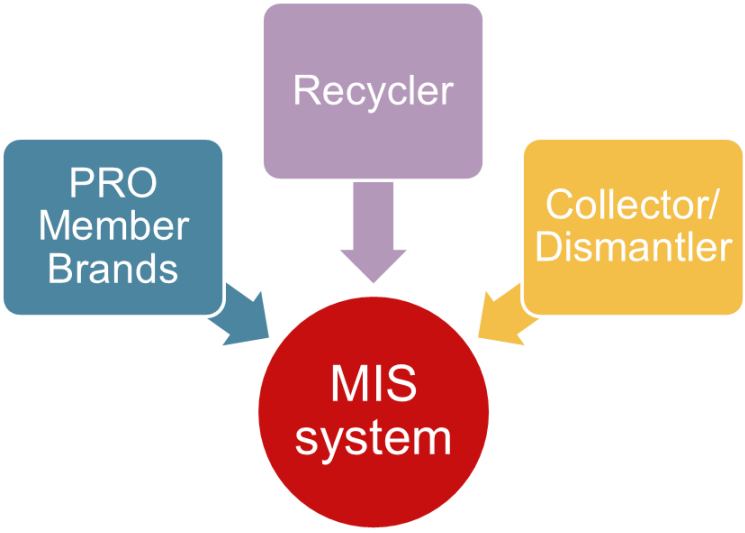
CITY LEVEL CAMPAIGNS

- The idea would be to mobilize as many people as possible within a city using media and other partners if needed
- Awareness sessions would be conducted across market and public spaces, newspapers, magazines, TV and other forms of media

METHODOLOGY and OUTPUT

- Targeted approach of popular public spaces based on Foot-Fall. Do week long collection drives and connect people to authorized collectors and recyclers
- Organizing a fest around the theme of E-waste after generating publicity and outreach through media
- Tying up with local institutions and Govt. Bodies for support

MIS system



- MIS would take care of the vendors/contracts in individual cities for monitoring and evaluation
- Provide easy access to numbers/volume across different cities
- MIS system makes the tracking of E-waste flow and handling easier. Each transaction/collection by the Recycler and formalized informal sector would have to be input into the system
- The MIS system would generate consolidated reports based on the inputs

Functional Features of PRO:

Collection and Storage

- Facilitate and Operate storage points
- Establish stronger and more efficient take-back systems and collections channels
- Plug leakages in the chain

Reporting & EPR Compliance

- PRO shall aggregate collection and recycling data and prepare reports catering to EPR compliance

Recycling Standards and Audit

- Setting-up of uniform norms and standards for member parties.
- Choosing Recyclers based on Stringent Criteria as decided by constituent members

Functional Features

- With a stronger take-back collection and storage channel, the PRO shall ensure lesser leakages in the system and work more towards a closed loop system
- Facilitate take-back from dealers/retailers
- Considering the economy of scale in operation, pooled in resources shall provide better efficiency
- PRO shall manage historical waste
- It shall ensure EPR Compliance by recycling contracts with Recyclers meeting set standards

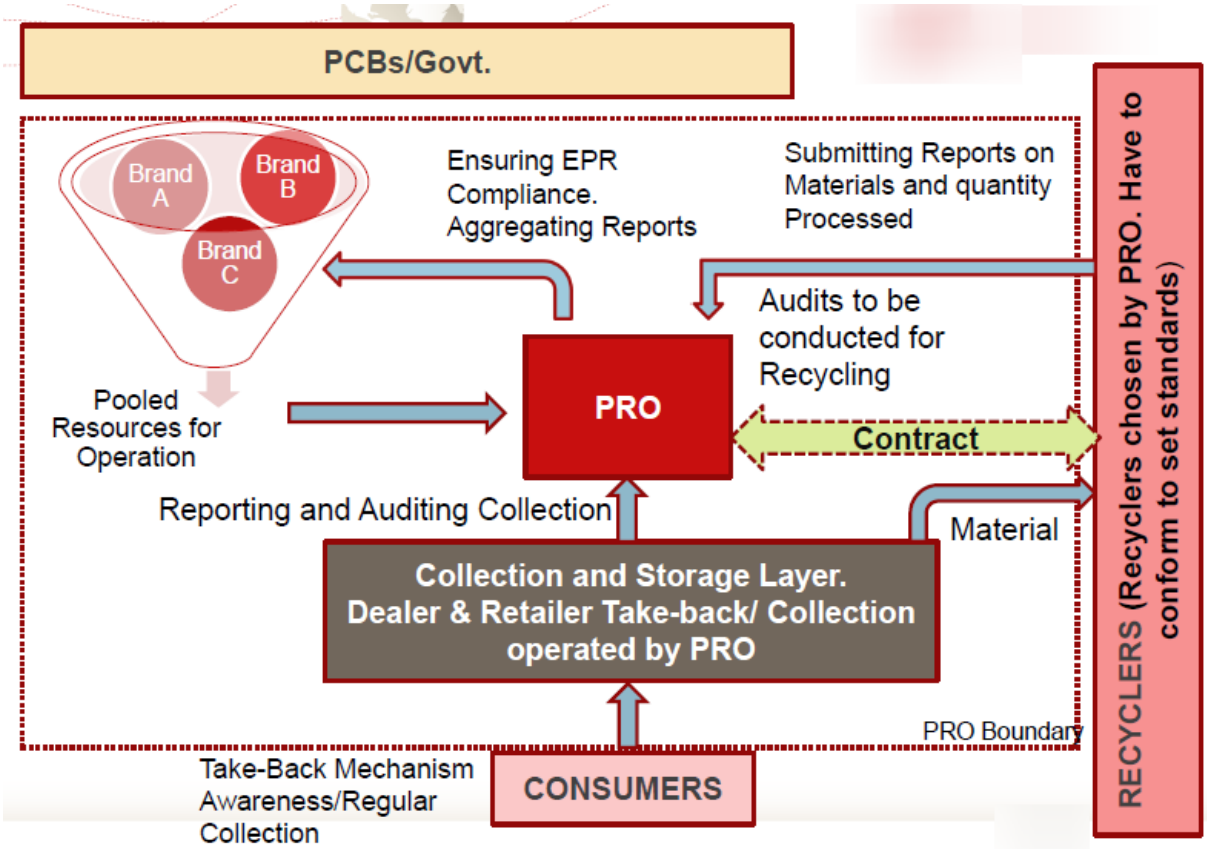


Figure 23: PRO functional diagram

KEY AREA	INDIVIDUAL	COLLECTIVE
Collection & Storage	Each producer sets up an individual take back system; ties up with collection agencies and centers Resource Intensive	More Resource Efficient especially in the case ofMulti-Brand retail takeback. Also PRO takescare of and coordinates with all Collection Channels
Reporting & Monitoring	Every producer deals with reports aboutcollection and monitoring individually	PRO takes care of end to end reporting andmonitoring for member Brands andManufacturers and prepares Reports for EPR compliance
Awareness & Capacity Building	Individual Brands approaching same consumer base (e.g. Schools/Colleges) might lead to over-lap and is also less resource efficient	More Resource Efficient. Common awareness and Capacity Building for a consumer base for all brands collectively. Also a common set of personnel and staff dealing with Operations can be trained collectively.
Recycling	Individual Brands deal with their own set of Vendors and Recyclers	Auditing, Rules and Standards based on the best practices in the Industry. Recyclers chosen based on best Standards. PRO takes care of auditing and Reporting with the Recyclers

Source: GIZ

Table 9: PRO collective advantage

Reporting

End to End reporting

- From individual dealers/retailers for takeback
- From storage points handled/operated by the PRO
- The total material from above sources shall then be transported to the Recycler and reported
- Recycler shall send report of both material handled and end amount shipped outside

Consolidated report

- PRO shall aggregate data from all the points above and prepare a consolidated report.

EPR Compliance

- The aggregated report shall cater to EPR compliance

Recycling Contracts

1. PRO shall deliberate upon and decide the recycling standards that have to be met
2. Contracts shall be issued to Recyclers only post auditing and only after ensuring that they comply by and meet the stringent criteria that have been set

3. Recyclers are bound to Comply. Non-compliance shall lead to immediate cancellation of contract

Auditing

- Auditing with regards to the collection will have to be done to ensure no leakages at the collection points
- Auditing of the Recycling facilities to ensure all material handed to the Recycler is processed including the end part shipped outside
- Annual audit of PRO itself by an independent body to check for confidentiality, operational and functional issues

Monitoring and Evaluation

- Developing structured achievable goals in terms of collection and recycling and setting corresponding targets
- Working towards achieving greater efficiency and depth in recycling
- Analyze associated costs and minimize them in a phased manner

Legal Implications

Data Confidentiality

- PROs will be dealing with confidential data from Member parties like the following
- Amount of material collected through take-back
- This is critical and confidential data and any form of leakage has to be avoided.
- The PRO shall be required to sign a confidentiality and non-disclosure agreement (not different from similar contracts signed by the recyclers)

Participation in a Consortium

- Pooling of resources to set up the consortium as well as the infrastructure
- Clear allocation of costs for setting up the infrastructure
- Clear deliverables against a contract to ensure that there is no cross subsidization across members of the PRO
- Can be ensured by maintaining brand specific collection bins which can be managed by the identified vendors of the brand.

Next steps

- Developing a work plan, with budget, for the PRO.
- Identification of implementing partners/ agencies/ individuals
- Launch the pilot activities in select cities (entry point could be the project cities of the EU project)
- Start with awareness activities followed by collection drives
- Review activities after 6 months of implementation

Case Studies PRO Models

Germany

The Federal Environment Agency (Umweltbundesamt, UBA) decided on July 6th, 2005 to grant the stiftung ear sovereign rights stated in the ElektroG. The stiftung ear protects the fair implemantation of the ElektroG, as it performs the following functions:

- **Registration** of producers that place electrical and electronic equipment on the market in Germany
- **Data collection** of the amounts of electrical and electronic equipment placed on the market
- **Coordination of the provision of containers and the take-back** of waste electrical and electronic equipments at the public waste disposal authorities (öffentlich-rechtliche Entsorgungsträger, örE)
- **Report of the annual flow of amounts** to the Federal Environment Agency
- Ensure, that all registered producers may participate in the internal setting of rules
- **Identification of free-riders** and the report of these to the Federal Environment Agency

Its work is financed by fees and expenses which are determined by the cost regulation by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesumweltministerium, BMU)

Electrical and electronic equipment from private households is collected in containers provided by the public waste disposal authorities. Producers are obliged to pick up the collected and provided waste electrical and electronic equipment immediately upon being ordered by *stiftung ear* to do so.

Source: http://www.stiftung-ear.de/about_us

The overall system responsible organization in Germany which functions as a clearing house is called Elektro-Altgeräteregister (EAR). EAR takes care of the administrative tasks of registering producers, calculating producers' market shares, verifying that all producers have lived up to their EPR, and reporting compliance data to the EU. Germany also requires that all producers, no matter their size, provide an insolvency-proven guarantee for the collection and treatment costs of the EEE they put on the market, again to minimize the free-rider problem.

In Germany, the producers have three options as to how they can comply with their EPR, referred to as take-back schemes. They may set up Individual Brand-Selective Take-back schemes (IBTS), join a Collective Take-back Scheme (CTS) or set up an Individual Non-selective Take-back Schemes (INTS). There is no producer implementing an IBTS scheme as it would be too costly.

Of the two options which do actually exist in Germany, the main distinction is that by choosing an INTS, theproducers must individually make arrangements with a treatment facility, whereas with a CTS, a collectivePRO does this on their behalf. Both of these options involve producers paying according to their marketshare as a proportion of the total WEEE collected and treated. As previously mentioned, all producers inGermany have to pay a financial guarantee for their WEEE arising, no matter if they have joined a PRO ornot (Okopol et al. 2007:52). Most common in Germany, therefore, is the INTS, where producers deal directly with the treatment companies. With this option producers have the freedom to choose a waste treatment facility and set requirements with them directly, which allows them to shop around for the best deal and keep their costs as low as possible.

One disadvantage of dealing directly with the waste treatment companies, though, is the considerable amount of administrative work that brings for a producer, because they are then responsible for handling all of the reporting work which would otherwise be done by a PRO. This has led several smaller producers, who do not have sufficient resources to set up internal systems to handle this task, to join collective PROs.

The German legislation prioritizes promoting competition and thus prohibits a monopoly on the collection and treatment of WEEE. The collective PROs are thus limited in the market share that they may represent for a specific category of WEEE. This limit is somewhat flexible, set according to how cooperation in some industry affects competition, however, the German “Bundeskartellamt” (Federal Cartel Authority) advised a limit of 25% of a specific category.

Source: http://rudar.ruc.dk/bitstream/1800/7209/1/Group%20No.%20764%20project%20-%20The%20WEEE%20Directive%20%26%20Extended%20Producer%20Responsibility.pdf

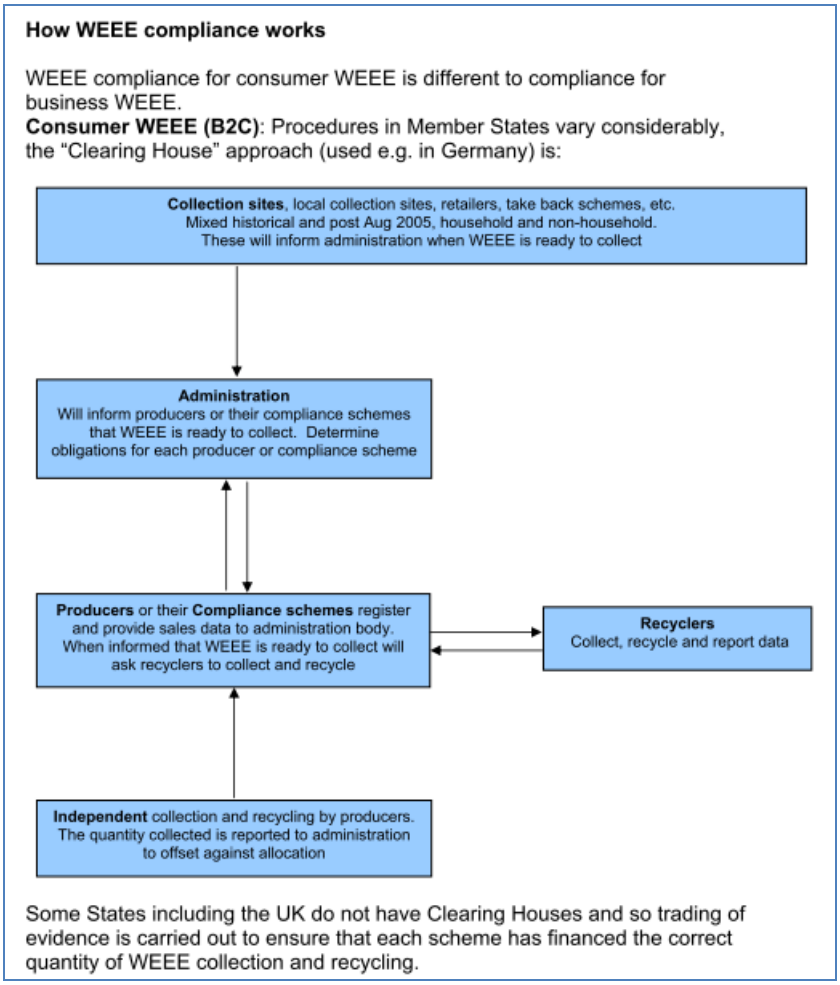


Figure 24: How WEEE compliance works
Source: http://ecsn-uk.org/Legislation/WEEE/2WEEE%20directive%20&%20implementation%20in%20EU%20sept09v2.pdf

France:

Has seven compliance schemes and these register their members on their behalf; there is no registration fee. Manufacturers are required to print the crossed wheelie bin symbol and producers name on products. France is one of the few countries that have a mandatory requirement to show “visible fees” at the point of sale of new B2C products. The visible fee informs the customer of the actual cost of collection, recycling and disposal at end-of-life and is part of the products price. French law requires that the French producer’s name be printed on products. This means that distributors who import equipment should apply labels with their name on each individual piece of equipment. In practice this is not done as it means re-packaging and it has been claimed

that this requirement could be illegal as it restricts the free movement of goods within the EU. Producers have to report on weight and number of sales annually.

Source: http://ecsn-uk.org/Legislation/WEEE/2WEEE%20directive%20&%20implementation%20in%20EU%20sept09v2.pdf

Producers must identify annually the quantities of EEE placed on market, the quantities of WEEE collected and recycled and the quantities of components/substances extracted in WEEE treatment. A national register of producers is held by the French Environment Agency, ADEME. Producers of household EEE must either (a) comply individually but seek approval or (b) join an accredited collective scheme. There is a choice of schemes named Eco-Organisms (EOs): Three general schemes (Eco-Systems, Ecologic and ERP) and a further scheme specific for lighting (Recyclum). No household EEE producer is currently complying through an individual route.Producers pay a fee for each product they supply onto the French market to their nominated EO. The fees vary according to both product and EO.Producers are only required to provide a financial guarantee if they are not a member of an EO. The financial guarantee would need to be sufficient to cover their producer obligations for the current year.Each EO contracts with specific municipalities (through OCAD3E) according to their expected level of WEEE required to meet their collection target. Each EO is required to collect freely all the WEEE collected by the distributers.

Source: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/w/12-1007-waste-electrical-and-electronic-weee-regulations-individual-producer-ipr-responsibility

Netherlands:

NVMP and ICT Milieu are the only two collective PROs in the Netherlands responsible for handling WEEE, and so it is relatively straightforward for them to report directly to the Dutch Environmental Assessment Agency. Producers in the Netherlands have only one feasible option as to how they will live up to their EPR: to jointhe collective PRO responsible for their specific WEEE waste stream. For the producers of IT&TE this meansthat they must collaborate with the collective PRO ICT Milieu, which is the only PRO that deals with thisspecific waste stream. In accordance with the Dutch law, producers may introduce their own collectionsystem, however - just as is the case in Germany – this has never happened because the cost of doing so istoo great to make it an economically feasible option. Furthermore, if a producer were to choose to not gothrough a collective PRO, it would then have to pay a financial guarantee which it otherwise would not haveto, which also serves as a disincentive for them to do so. With a monopoly on the IT&TE WEEE treatment market, ICT Milieu faces no pressure to try to keep its costs low. Therefore, treatment costs are significantly higher in the Netherlands than they are in Germany.Non-competitive systems on the other hand, like the Dutch one, are easier to monitor. According to ICT Milieu, this enables them to achieve a higher producer registration compliance rate.

Source: http://rudar.ruc.dk/bitstream/1800/7209/1/Group%20No.%20764%20project%20-%20The%20WEEE%20Directive%20%26%20Extended%20Producer%20Responsibility.pdf

Usage of two economic instruments: Visible Fee & Municipal Waste Tax. Municipal waste tax funds the municipal infrastructure used in WEEE/E-waste management. Producers/ Importers pay NVMP to manage their WEEE/ E-waste responsibilities under Dutch legislation. A fixed fee is paid to NVMP for each product placed on the market. This fee is passed on to the consumer with no mark up. The scheme covers household WEEE/ E-waste. Households pay a visible fee on the purchase of new EE products. Households pay a local municipal waste tax to fund general waste collection and operation of municipal sites.

Source: http://www.unep.or.jp/IETC/SPC/news-jul11/UNEP_Ewaste_Manual3_TakeBackSystem.pdf

The Dutch Foundation for the Disposal of Metal and Electrical Products (NVMP) set up a collective disposal system for the collection and recycling of discarded equipment covered by the Decree. All producers and importers can affiliate themselves with the foundation. The NVMP is a Producer Responsibility Organisation (PRO) which has more than 1200 producers and importers affiliated with it.160 Participation in the NVMP is free of charge and ensures its members meet all statutory obligations. The ADF is used to finance an environmentally friendly system for collecting and recycling electrical and electronic appliances. The ICT Milieu Foundation covers WEEE category 3 (IT, hardware, paper printing devices and telecom). 275 companies take part in the ICT Takeback system (as at January 2007). In contrast to the waste disposal scheme used for white and brown goods, manufacturers and importers of the ICT themselves pay the environmental costs of recycling and collection. They are charged for the amount of WEEE collected and treated based on their market share.

Source. http://www.envision-nz.com/images/product%20waste%20report.pdf

Sweden

Producers (importers, manufacturers and retailers) are required to register with the Swedish Environmental Protection Agency (Naturvårdsverket).Local Regional Authorities (LRAs), or municipalities, are responsible for collecting and treating household WEEE. Household consumers may return WEEE to one of 650 waste recycling centres paid for by the municipalities free of charge. The municipalities are also responsible for the local monitoring of the collection system, and for informing consumers where they may dispose of their WEEE-products. WEEE is collected in separate bins owned by El-Kretsen

El-Kretsen is a not-for-profit service provider set up in July 2001 to represent producers (manufacturers, importers and retailers) in their agreement with the Local Regional Authorities (LRAs) and to operate a voluntary nationwide take-back system. El-Kretsen is responsible for sorting, treatment and recycling. Waste is sorted into three fractions at the point of collection: electronics, large white goods, and lighting. The transport of the waste from the collection centres to relevant recycling organisation is organised and financed by El-Kretsen, using subcontractors. Treatment and recycling firms are chosen on the basis of technical ability, location and price. El-Kretsen provides 100% coverage of the Swedish Territory and has concluded standardised agreements with all 290 local municipalities to take responsibility for historic waste in return for the maintenance of collection sites.Producers choosing to join El-Kretsen are given the opportunity of being included in El-Kretsen's financial guarantee system. This system ensures there are sufficient funds to finance El Kretsen's operation in the forthcoming year, there is a reserve fund for the following year and that there is an insurance arrangement which would 'kick in' in the event of bankruptcy.

EÅF, launched in 2008, uses its members' shops as collection points for household WEEE. EÅF has an agreement with El-Kretsen as member shops are not located in all municipalities.Members of EÅF use a different financial guarantee system to El-Kretsen members. The financial guarantee used by EÅF members is an insurance system whereby the producer pays an annual insurance premium based on the number of products sold and the recycling costs of the products. The insurance premium goes to a fund that finances the recycling costs for the electric waste of the producer. In case the producer goes into bankruptcy or leaves the market due to other reasons, the insurance company would continue to pay the recycling costs of the producer and thus ensure that the producer will not become a free-rider.Some small companies choose to meet their financial guarantee requirement through setting up a block banked account which is pledged to the Swedish EPA should they go out of business.

Source: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/w/12-1007-waste-electrical-and-electronic-weee-regulations-individual-producer-ipr-responsibility

UK:

All producers must join one of the approved PCS of which there are over 40 in the UK. The PCS registers producers on their behalf and pays the registration fees. Manufacturers should print the crossed wheelie bin symbol and producers name on all products. Quarterly reporting of sales in terms of weight and number is required. Showing the visible fee is optional in the UK but it is not used, mainly as it is strongly disliked by retailers.

Source: http://ecsn-uk.org/Legislation/WEEE/2WEEE%20directive%20&%20implementation%20in%20EU%20sept09v2.pdf

EEE producers, importers and re-branders must join a producer compliance scheme or establish their own. Either way, the scheme needs to be approved by an environment agency. Producers are financially responsible for collecting, treating, recovering and disposing of WEEE (Waste Electrical and Electronic Equipment). The amount they are responsible for is calculated according to the amount of EEE they produce. They must arrange and pay for the dismantling, recovery, reuse and recycling of WEEE in an environmentally sound way. WEEE must only be taken to Approved Authorized Treatment Facilities (AATF).

Source: http://www.envision-nz.com/images/product%20waste%20report.pdf

Korea:

The government sets mandatory take-back and recycling requirements for each product, and producers pay fees to join a PRO that handles all of the collection and recycling obligations. Financial penalties are assessed on producers that do not meet their obligations.In addition to the EPR program, “waste dues” are levied on particular products and the revenues used to pay for local government collection and recycling efforts.

Source: http://www.rff.org/RFF/documents/RFF-DP-06-08.pdf

Switzerland

The Swiss Association for the Information, Communication and Organisational Technologies (SWICO), the Swiss Foundation for Waste Management (S.EN.S), the Swiss Lighting Recycling Foundation (SLRS), and the Lobby for Battery Disposal (INOBAT) are the industry-led organizations that manage e-waste in Switzerland. SWICO covers IT and Consumer Electronics, SNES covers household appliances, SLRS lighting bulbs and equipment and INOBAT batteries.

In 1993, SWICO was established as an industry-led, voluntary system to provide ewaste management for IT and office electronics. Retailers are mandated to take back e-waste in the categories they have on sale free of charge, regardless of whether they were the original seller or whether the consumer is purchasing similar product. Producers, manufacturers, and importers are also obligated to have a take-back program. Recycling plants are required to obtain approval from SWICO.

The EU’s WEEE Directive requires free take-back for e-waste, coming from private households, but ORDEE (the Swiss legal framework for e-waste) does not distinguish between e-waste from private users or firms. Another difference between the WEEE Directive and ORDEE is that Switzerland uses the advanced recycling fee (ARF) for all existing e-waste, whereas based on the WEEE Directive manufacturers are only responsible for financing e-waste that was in the market after the Directive was implemented. In Switzerland e-waste is collected regardless of brand and time of purchase, which eliminates excess costs for sorting and collection that can be imposed by the WEEE Directive on local collective authorities.

Producers and importers have to pay an advanced recycling fee (ARF) in ‘CHF per unit’ for every product placed on the Swiss market. These ARF-Funds are managed by SENS. The income from the ARF finances the

present collection and treatment of WEEE, similar to a pay-as-you-go pension scheme. Thereby the ARF is a participation of the buyers of new appliances to the current costs.

SWICO system does not hold municipalities obligated for establishing an e-waste take-back program; however, it covers all finances if municipalities choose to participate in take-back programs, and if they take back more than five tonnes per annum, they will be considered one of the SWICO designated collection points.

The ORDEE does not elaborate the implementation of the directive, merely outlines the essential guidelines. Therefore, it doesn't give the PROs the specific mandate for the collection. The companies have the choice of either participating in the PRO or setting up a parallel system. In case of consumer or recycler complaints of monopolistic abuse of power by the PROs, the competition authorities have the power to intervene.

In Switzerland, the producers carry the economic and physical responsibility of their products. By combining the economic and physical responsibilities, it is possible for the producers to control both costs of handling and recycling as well as the volume and quality of recycling. However, instead of setting up individual mechanisms, the manufacturers and importers have assigned their responsibility to the PROs SWICO and SENS. The manufacturers and importers, in turn, to participate in the system, must regularly report their sales figures and ARF to the PROs. The manufacturers have the freedom to organise a collection of only their products and bring it to the licensed recyclers, even while being a part of the SWICO system.

SWICO and, more recently, SENS adopted an ARF which is based on recycling costs today for products coming into the waste stream in the present. The risk of setting such an intergenerational fee is that it needs accurate estimations of how much waste will be generated and how many new products will be sold, which can be a difficult task. For example 1.75 million mobile phones were sold in Switzerland, but only 250,000 were returned. A mismatch, the other way around, with higher quantities of waste generated as compared to products sold, would jeopardise the stability of the system. SWICO and SENS overcome this drawback by keeping a six months reserve and constantly monitoring the quantities of both waste and ARF collected.

The SWICO Environmental Commission, which comprises of manufacturers from the various industry verticals participating in the system, sets the ARF. SWICO uses a product price index according to which the ARF is calculated. The fee ranges from zero, for products below CHF 50, to CHF 1650 for products above CHF 6000.SENS on the other hand has six distinct fee categories, ranging from CHF 1 to CHF 40, under which all the products are classified. The category under which a product falls depends on the type as well as size of the product.

Source: http://www.e-waste.ch/en/system-design/actors-2.html

Canada / Ontario

In order to develop and implement waste diversion programs, the Ontario Electronic Stewardship (OES), a “producers" umbrella organization”, was incorporated in September 2007, and approved by WDO in October of the same year to act as an IFO for e-waste management (OES, 2009). OES is a non-profit organization that is governed by a volunteer Board of Directors that consists of brand owners, first importers, franchisors, and assemblers.
In Ontario, Stewards, including manufacturers, producers, brand owners, firstimporters/assemblers of non-branded products for sale and use in Ontario that result in e-wastehave to register with OES, pay a monthly unit fee, and report the type and quantity of electricaland electronic equipment that they supply into Ontario (OES, 2008). OES in return providesthem with incentives for managing their e-waste. Producers such as Hewlett-Packard, Dell andApple have established their own take-back programs due to the high participation costs imposedby OES.

In Ontario, consumers may get charged for recycling fees upon the drop-off of their e-waste depending on the type of available take-back program that is offered by the collection sites.

Denmark

Main actors of the Danish take-back system include the producers, the municipal waste collection authorities, the private waste treatment companies, the newly-established Danish Producer Responsibility system (DanskProducent Ansvar system, hereafter referred to as DPA-system) which functioned as a clearing house and four privately-organized collective PROs.

Even though the WEEE directive states that the producers must bear the financial and/or physical responsibility of WEEE collection, in Denmark the municipality continues to operate the physical collection and bear the cost of the collection of WEEE, which means that actually the Danish tax payers are the ones who bear the financial responsibility of collecting WEEE. One significant change since the WEEE directive was transposed in Denmark, though, is that before the municipalities were responsible for coordinating the transport and sale of WEEE to the private treatment facilities, whereas now collective PROs organize this and the clearing house coordinates the work of the PROs.

Whereas the producers are financially responsible for covering the costs of treating WEEE in Denmark, they do not have much at all to do with the physical responsibility of that WEEE treatment. This treatment takes place at one of three licensed WEEE treatment facilities in Denmark which are operated by secondary companies whose revenue comes from the payments they receive from the PROs.

The majority of the producers in Denmark have joined collective PROs to take care of certain administrative and organizational matters regarding EPR on their behalf. These collective PROs are non-profit organizations set up by the producers to provide services on their behalf. These duties include producer registration, annual reporting to DPA-system and the payment of financial security. To fulfill these duties, the collective PROs calculate each of their member producers' market share and charge them for their treatment costs accordingly, manage the coordination and payment between the municipal waste collection points, transport companies, and waste treatment facilities, and report this information to DPA system. There exist only three collective PROs in Denmark - RENE, Elretur, ERP -which deal with the IT&TE waste stream.

However, a few producers have chosen to individually manage their EPR because they have found it cheaper to do so in comparison to the collective PRO alternative. The few producers in Denmark who comply with EPR requirements individually have to pay a financial guarantee up front to ensure that they will actually be able to pay for the treatment of their WEEE arising in case of bankruptcy or insolvency; whereas producers in Denmark who are members of collective PROs do not have to pay this guarantee, since a PRO membership in Denmark works as a guarantee in itself

Source: http://rudar.ruc.dk/bitstream/1800/7209/1/Group%20No.%20764%20project%20-%20The%20WEEE%20Directive%20%26%20Extended%20Producer%20Responsibility.pdf

Austria

Austrian-based Producers, as well as retailers or foreign companies selling to Austria via telesales, must register online at http://edm.umweltbundesamt.at and must report annually the quantity of EEE sold in Austria. According to the Austrian Ordinance on WEEE, producers and importers can either fulfil their future household WEEE obligations individually or by joining a Collection and Recovery Systems (CRS). To date, no Producer has chosen to fulfil the WEEE obligations individually. By joining a CRS, the WEEE obligations and duties are transferred to the operator of the CRS. There are five CRSs (representing 2,047 producers at the end of 2009)

To ensure fair competition, a coordination body called "the clearing house" was established, controlled by the Ministry of Environment. The clearing house is operated by Elektroaltgeräte Koordinierungsstelle Austria

GmbH (EAK). EAK coordinates CRS activities and allocates pickup orders according to the CRS market share. Producers must submit quarterly and annual reports to the clearing house (either directly or via a collective scheme).

Source: http://www.bis.gov.uk/assets/biscore/business-sectors/docs/w/12-1007-waste-electrical-and-electronic-weee-regulations-individual-producer-ipr-responsibility

Japan

Manufacturers have responsibility for recycling their own products. Manufacturers can organise take back themselves or contract another organization, such as The Association for Electric Home Appliances (AEHA), to do it on their behalf. Some manufacturers have built their own recycling plants which means getting enough EEE waste is vital to their efficiency.Retailers must also offer consumers a like-for-like Take Back or Take Back of an old product that they have sold. The Ministry of Environment estimates that 80% of recycled appliances are being collected through retail outlets. Manufacturers must finance the recycling of their own products. This is aided by the consumer collection fees which are given to manufacturers on a monthly basis. As these do not cover all the costs involved, manufacturers must pay the remainder. The AEHA is responsible for orphan products as well as establishing the recycling ticket centre which administers the recycling fees.

Source: http://www.envision-nz.com/images/product%20waste%20report.pdf

10. Create awareness on e-waste with all Stakeholders:

According to the E-Waste (Management) Rules, 2016, it is mandatory to provide Details of proposed awareness programmes and the estimated budget for the same while producers seeking Extended Producer Responsibility –Authorisation through FORM I.

It is the responsibility of the producer for creating awareness through media, publications, advertisements, posters, or by any other means of communication and product user documentation accompanying the equipment, with regard to -

i. information on address, e-mail address, toll-free telephone numbers or helpline numbers and web site;
ii. information on hazardous constituents as specified in sub-rule 1 of rule 16 in electrical and electronic equipment;
iii. information on hazards of improper handling, disposal, accidental breakage, damage or improper recycling of e-waste;
iv. instructions for handling and disposal of the equipment after its use, along with the Do’s and Don’ts;
v. affixing a visible, legible and indelible symbol given below on the products or product user documentation to prevent e-waste from being dropped in garbage bins containing waste destined for disposal;

vi. means and mechanism available for their consumers to return e-waste for recycling including the details of Deposit Refund Scheme, if applicable;

Case Study: Samsung's S.T.A.R. Program

Digital technology leader, Samsung India Electronics Pvt. Ltd. On 31st August, 2010 announced the launch of Samsung Takeback And Recycle (STAR) Program in India. The program is aimed at generating awareness and educating consumers on the importance of recycling e waste and is being rolled out nationally in phases. Through the program, Samsung is leading the efforts to create a recycling based society and at the same time it is making contributions to preserving the environment and using resources efficiently. With this initiative Samsung aim to encourage sustainable practices and induce a behavioral change among the Indian consumer.

As a part of that program, Samsung encourage consumers to recycle Samsung branded consumer electronics sold in India ranging from Televisions, DVD and VHS players, Audio Equipment and Home Theater Systems, Mobile Phones, Cameras, Camcorders, Computer Monitors, Printers, IT Peripherals and Home Appliances absolutely free of cost. Consumers have to dispose portable products at 235 locations in 20 cities across the Samsung service center network. For bigger products, consumers can avail the product collection facility on a nominal payment basis (if the location is outside the municipal limits) or drop the product at any of the Company's 291 collection centers in 21 cities.It has now been extended to national level.

Uniqueness of STAR Program:

- Samsung has entered into contracts directly with CPCB authorized e-waste recyclers for product take back and recycling .
- Second, Samsung's recycling partners has committed to not incinerating, land filling, or exporting toxic waste to developing countries.

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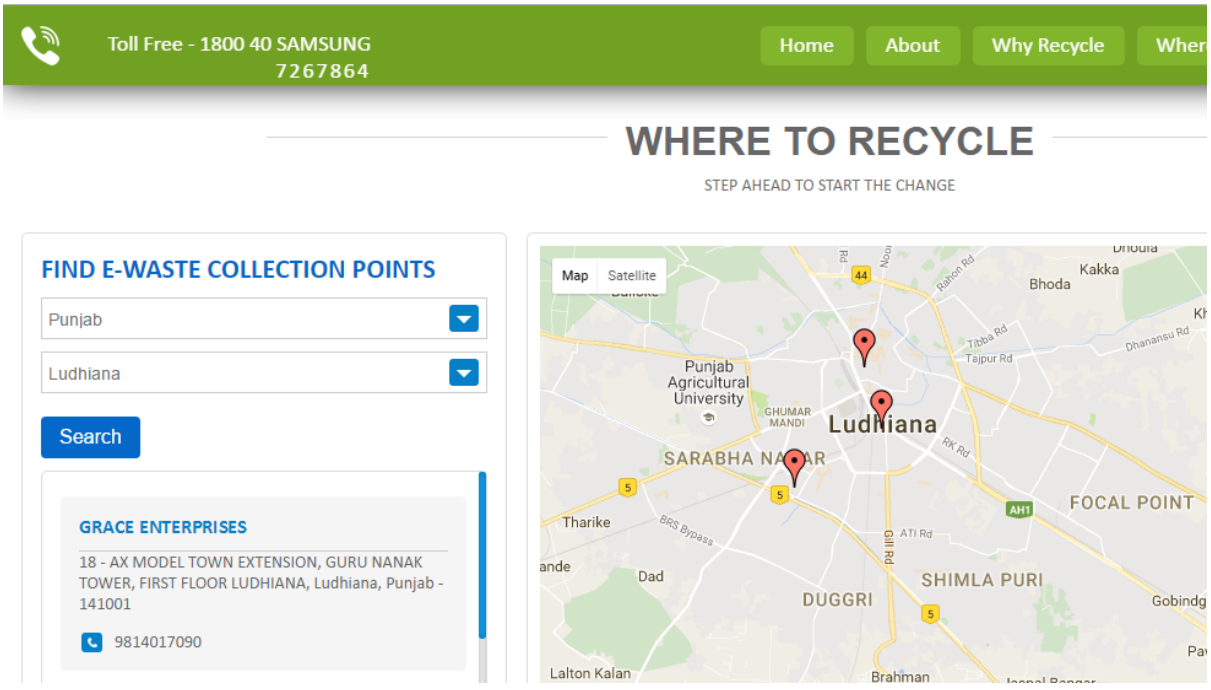

Figure 25: Samsung's e-waste collection point search portal
Source: http://www.samsung.com/in/microsite/takeback-recycling/

11. How can you work with the informal sector for e-waste collection?

“World Environment Day” Study

Electrical and electronic waste (e-waste) is one of the fastest growing waste streams in the world. In a recent study on “World Environment Day” conducted by ASSOCHAM-cKinetics found that India's e-waste growing at 30% per annum and likely to generate 52 lakh metric tonnes (MT) per annum by 2020. As Indians become richer and spend more electronic items and appliances, Computer equipment accounts for almost 70% of e-waste material followed by telecommunication equipment (12%), electrical equipment (8%) and medical equipment (7%). Other equipment, including household e-crap account for the remaining 4%, it said.

The sad part is that a mere 1.5% of India's total e-waste gets recycled due to poor infrastructure, legislation and framework which lead to a waste of diminishing natural resources, irreparable damage of environment and health of the people working in industry. Over 95% of e-waste generated is managed by the unorganised sector and scrap dealers in this market, dismantle the disposed products instead of recycling it.

E-Waste Management: Informal Sector

E-waste recycling in the informal sector provides jobs to thousands of people and supports the formal waste management agencies like municipalities. Though the informal but entrepreneurial SME based infrastructure permits a profitable e-waste management business but at the same time, the informal sector is lacking skills and technologies, and manages hazardous material without any regard to occupational health and safety (OH&S) requirements and in an environmental harmful manner. It is observed that with rising e-waste quantities the recycling scenario is changing, with the formal recyclersincreasingly entering the e-waste recycling sector. There is a widespread expectation that these formal sector recyclers would be able to manage e-waste in an environmentally sound manner by using Best Available Technologies (BAT) leading to better environment management and enhanced resource recovery. However, it is not clear whether the advent of formal recycling would come at the expense of informal sector recyclers or would complement their activities.

Bridging the Gap Between The Informal And Formal Sector

In a paper *E-Waste Recycling In India – Bridging The Gap Between The Informal And Formal Sector* Dr. Lakshmi Raghupathy, MAIT-GTZ , Mrs Christine Krüger, Adelphi, Dr. Ashish Chaturvedi, GTZ-ASEM , Dr. Rachna Arora, GTZ-ASEM, Mr Mikael P. Henzler, Adelphi at http://www.iswa.org/uploads/tx_iswaknowledgebase/Krueger.pdf)the authors discuss the various options for bridging the gap between the formal and informal divide in e-waste management in India. Presented here is a model which allows for the integration of the informal and the formal sectors in India. It also highlights the mutual benefits of increased cooperation between the formal and informal sector because of their competitive advantages. Various aspects of the model have been illustrated with focus on several initiatives implemented in India

The model presented here allows the integration of the informal and the formal sectors in India. The broad building blocks of this model are

i. Federating disparate informal sector workers into collectives;

ii. Capacity building at various stages of the e-waste value chain;
iii. Development of appropriate framework conditions in support of the informal sector;
iv. Elaboration of applicable business structures taking into account the constraints and resources of the informal and formal sectors, and
v. Implementation, monitoring and evaluation of the model in different baseline situations.

The authors show that there are mutual gains to be obtained from an increased cooperation between the formal and informal sector because of their competitive advantages. Social welfare is enhanced through this interaction. It furthermore leads to reduced pollution, better resource management and creation of green jobs in the recycling sector.

The process of integrating the informal sector with the formal sector, however, is a challenging one. On one hand, too little is still being known on the diversity of networking amongst informal recyclers, and their distribution of tasks and financial mechanisms amongst the various stakeholders. On the other hand, the informal sector is very diverse and comprises multiple stakeholders, and hence, requires a multi-level approach to develop a path forward to their inclusion in the formal recycling market.

The following two graphics show a simplified architecture of the existing e-waste recycling system and the distribution of activities between the formal and informal sector.

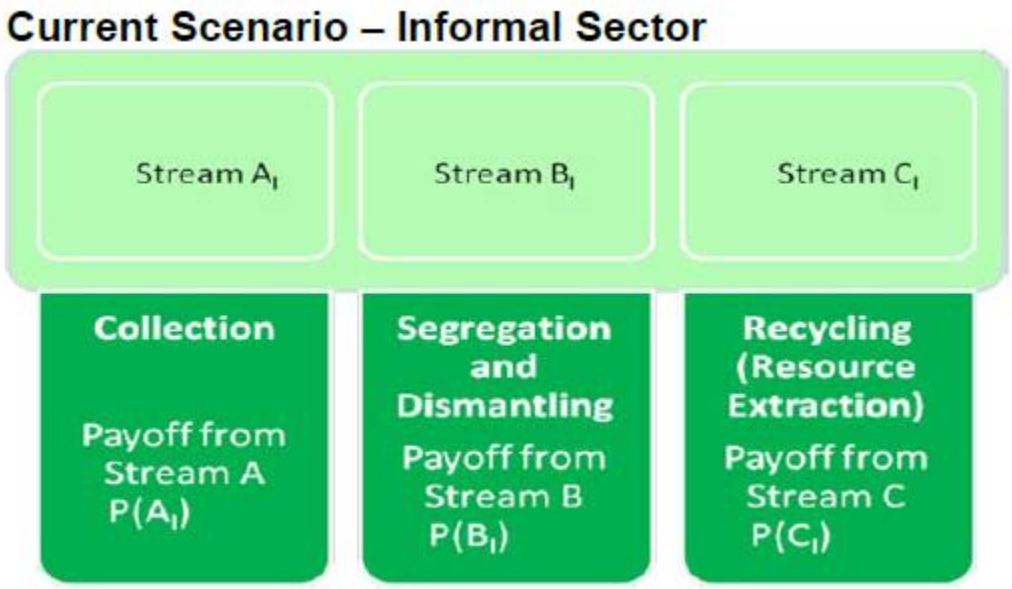

Figure 26: Current scenario – Informal Sector

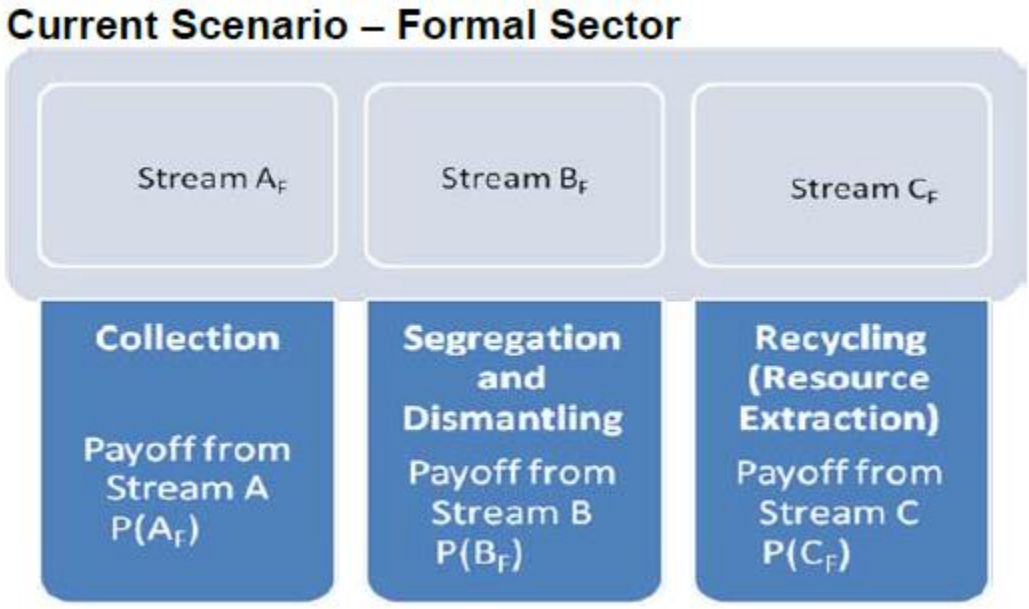

Figure 27: Current scenario – Formal Sector

The scenario is changing at a faster pace now with the formal recyclers entering the scene and high-end recycling envisaging complete environmental compliance and efficiency in the processing of waste and the recovery of a high quality product. But such units are unable to access the materials due to the informal collectors, scrap dealers and recyclers in the informal sector who are able to reach for the door-to-door collection and are able to pay a good price for the e-waste in comparison to the formal recyclers. The formal recycling units have high investments and high overheads to meet the environmental compliance requirements. As a result they are not able to meet the price demanded by the vendors or the consumers and are thus unable to access e-waste.

A mutual support system that could be provided by the operations in the informal and formal recycling units as reflected is ideal for developing economies. The system will provide a balance between the cheap labour intensive operations in the informal sector and the sophisticated mechanized operations in the formal recycling units. The following two graphics show first, the intervention scenario and second, the proposed future scenario.

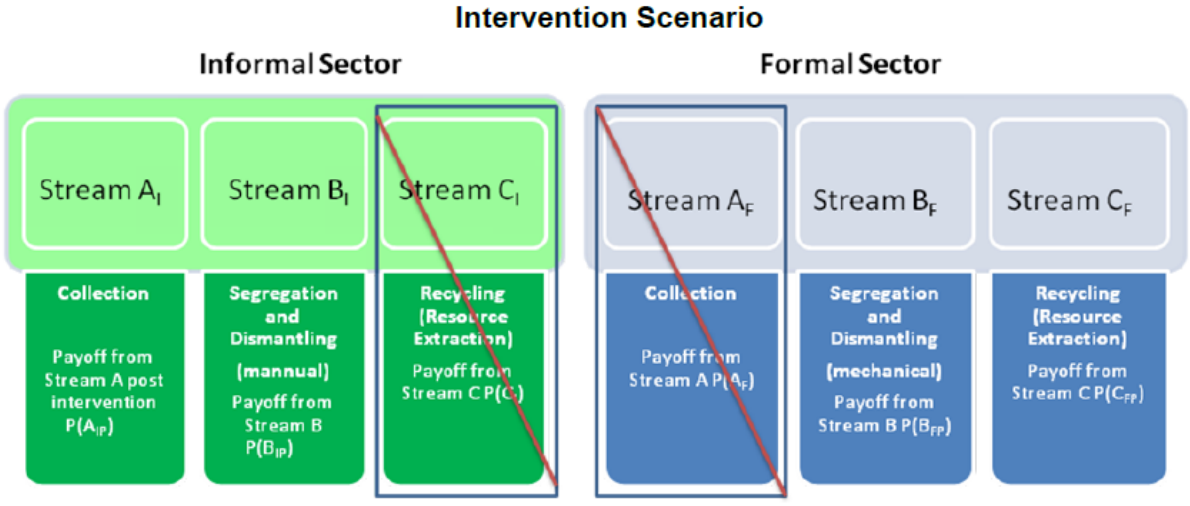

Figure 28: Intervention scenario

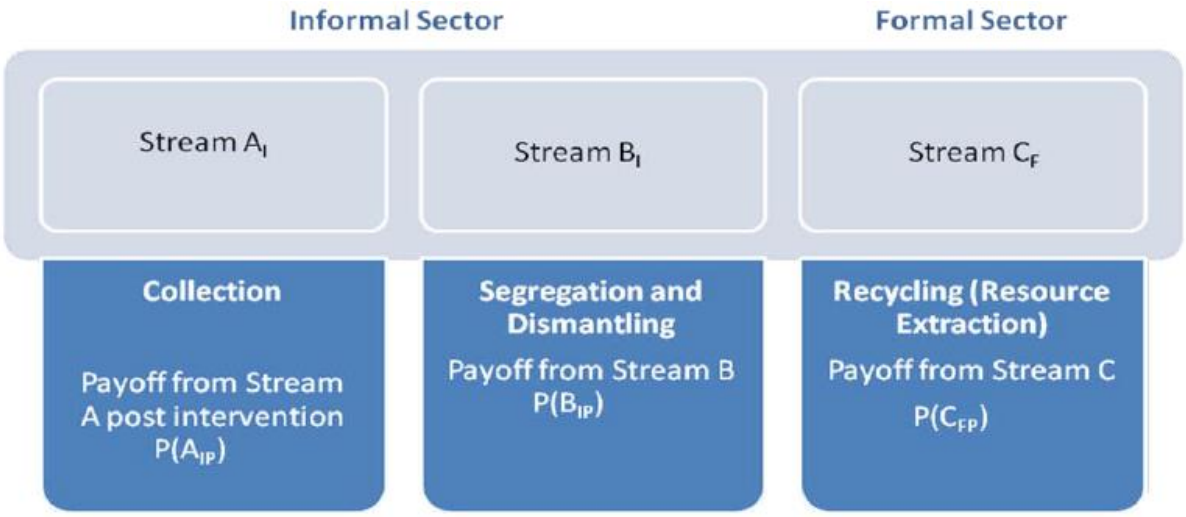

Figure 29: Proposed scenario

The optimization of resource flows is required to obtain quality products and has to be set as a goal while providing the model for integrating informal and formal e-waste recyclers. As a first step in the process all elements of the value chain need to be identified and all stakeholders have to be involved. The mechanism of transfer of e-waste needs to be planned in such a way that the material reaches its destination in the shortest time possible and avoids any pilferage during handling and transit. A system of collection and transportation using third party or involving multi-stakeholder system would be a viable solution. Saving time and energy in the operations should become an integral part of the system.

The model provides the interaction between the formal and informal sector taking the interests of both into account in a rational choice framework. The model shows that there are mutual gains to be obtained from the trade of material from the informal and formal sectors because of their comparative advantages. We also show that the social welfare is enhanced by this interaction between the formal and informal sector and results in reduced pollution, better resource management and creation of green jobs in the recycling sector. The model recommends that the collection, segregation and primary dismantling of non-hazardous fractions of e-waste be focused in the informal sector while the other higher order processes can be concentrated in the formal sector.

Producer responsibility

It is crucial to motivate the large e-waste generators to apply minimum standards for their e-waste disposal. The new legal framework will help implementing this. Awareness measures need to provide accompanying guidance to enhance enforcement.

Governmental support and financial incentives

Due to the limited access of the informal sector to financial resources (e.g. loans) it has to be discussed if financial incentives need to be provided to the informal sector stakeholder to allow i) its formalisation process and ii) the improvement of its processes towards compliance with environmental, health and safety standards. E.g. specific allocation of funds for environmental surveillance and evolving Public Private Partnership (PPP) model based systems could be introduced. Additionally, financial aid/access to credit/ incentives/ subsidies and insurance scheme are further measures that may need to be made available. One of the best methods to improve the practices is to offer incentives to those complying with environment and health norms and also

promote marketing of such products through a certification mechanism. This would then likewise benefit the formal recyclers, who in return should not be left out since their motivation to invest in this sector are also crucial basis for development of a sound e-waste recycling system. Hence, competitive aspects between the formal and informal sector require attention, and should not be neglected during the supporting process of the informal sector.

Promoting Women's Participation in e-Waste Recycling:

With an objective of environmentally sound recycling the Development Partnership Project (DPP) between GIZ India and the private sector Microsoft India Pvt. Ltd.(earlier NOKIA) was launched in 2012. GIZ India is implementing this DPP project on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). The overall objective of the project was to improve the collection and recycling of e-waste from mobile phones and accessories in a more efficient and sustainable way in selected target cities of India, enhancing the consumption behavior of students and youth and improving the working conditions for informal waste collectors. The initiative had three inter-linked components and work packages viz. Schools to enhance the capacities of the teachers and students on sustainable consumption and safe e-waste disposal; Youth for reaching out to the young population for integrating sustainability and creative design and Informal Sector to focus on mainstreaming and formalization of the informal sector involved inhandling e-waste.

The project was developed on the experiences of GIZ India under the EU Switch Asia project titled WEEE Recycle, of working with the unorganized workers through partnershipswith local NGOs and waste pickers unions like the Solid Waste Collection and Handling (SWaCH) in Pune4, India. The learnings from working with agencies like SWaCH led to setting up of collection models which could be formalised and acceptable to government agencies, producers & manufacturers and bulk consumers. Another crucial aspect of this model was reaching out to the public or individual consumers and households, as under EPR reaching out to household consumers is one of the biggest challenges for the producers and manufacturers. This led to the selection of an agency named Self Employed Women's Association (SEWA) to implement the DPP project in Ahmedabad, Gujarat and work with the informal sector workers. SEWA as a partner was selected due to the following reasons:

a) To develop a collection model which reaches out to households consumers, bulk consumers, commercial establishments, schools and other institutions in the city;
b) To contribute to the political and economic empowerment of women waste pickers and in the process enable self-sufficiency;
c) To develop a recognition of the collection network of the informal sector workers ranging from door to door collection, storage & handling and transfer to authorized recyclers to ensure material recycling and recovery;
d) To develop a demonstration model for SEWA as an e-waste venture, which has huge potential for its upscaling and replication.

Informal to Formal Women Cooperation Model

Women waste pickers in the Ahmedabad region were initially engaged in sorting of municipal waste from dump yard, like similar others do. They often found e-waste as well while sorting the municipal waste dumps for recyclables, and eventually sell these to kabadiwalas (scrap dealers). This e-waste, categorized as 'black plastics' in local terminology for any discarded electronics item, used to fetch them little money. In order to get more economic benefits, they started burning the waste to extract copper and other precious metals, so as to get more value for the metals from the market. In this entire process, these waste pickers risk their health unknowingly by releasing heavy metals like lead, cadmium, mercury etc. additionally resulting in environmental pollution.

Under the project, SEWA received trainings from GIZ India and Microsoft on the adverse effects of the uncontrolled burning of e-waste and the benefits of safe handling, collection, dismantling and recycling of e-waste. Under the umbrella of the cooperative, SEWA identified 50 women workers with the willingness to collect e-waste from residential and commercial establishments and to channelize the e-waste to the formal recyclers. These 50 women entrepreneurs are the change agents as they not only approached their fellow women workers towards safe handling of e-waste but also made visits to 500 shops, 100 schools, government offices, residential wards, multiplexes and malls to collect e-waste. SEWA is the first waste pickers union to be authorised as a collection agency by a Producer - Microsoft. In fact this authorisation and pilot model provides an example for countrywide replication and adoption by other municipalities, producers and bulk consumers. This intervention leads to not only fulfilment of the producer responsibility (EPR) but also enhances the social responsibility of the brand by creating green jobs and mainstreaming existing collection channels.

GIZ India with Microsoft was involved in the implementation of the development partnership to a large extent with SEWA. Capacity development initiatives through training workshops were developed, designed and implemented where group discussions, role plays and site visits for exchange of experiences were seen as useful tools. These workshops also included management approaches which focused on marketing skills necessary for tackling all categories of consumers for collection and channelization of e-waste. The partnership supported considerable increase in the outreach and impact of the awareness campaigns.

This partnership has empowered SEWA to apply for a formal recognition of the collection model by the stateregulatory agency i.e. Gujarat Pollution Control Board under the E-waste Management and Handling Rules, 2011. The other major results are as follows:

• *Increase in earning*: Their monthly income has increased from INR 1500-2000 to INR 2400-2500 which is around 40% increase on an average for the SEWA members;

• *Improvements in living conditions*: Extra earning eventually resulted in betterment of their living by providing better food for their children and being able to hire private tutors for their children’s education;

• *Savings in time*: Previously, SEWA women were devoting the entire day for sorting and collection of solid waste from which their earnings were low. Currently, devoting just two hours a week towards the collection of e-waste has helped ensure these women extra income;

• *Recognition of waste pickers*: Initially these rag pickers never got waste from any formal waste sources like schools, commercial establishments etc. but upon attaining authorization they were able to access formal channels of e-waste ;

• *Environmental savings:* The workers have been able to channelize three tons of e-waste to the authorised recycler for processing and recovery of materials leading to a closed loop economy;

• *Awareness creation at local level*: SEWA carries a trust and brand name in Ahmedabad due to their work ofsolid waste. Their messaging on proper e-waste collection and channelization has been able to connect the schools, youth, colleges and other institutions to adopt sustainable consumption practices to channelize e-waste to the proper recycling channels;

• *Reduction to occupational risks*: Prior to the trainings received under the project, the women wouldbe accompanied by their children to the work place. This practice has stopped, leading to improvements in overall education and health of their children.

12.How to make EPR plans?

A producer company may practice its EPR either individually or collectively. Though these two implementation modes may seem contradictory, they are in fact complementary and are the two pillars of EPR. In other words, when IPR is desired, a collective solution is also necessary. The following paragraphs explain the mechanisms of both individual and collective models.

Individual Producer Responsibility Model

Producer

According to (Manomaivibool and Lindhqvist, forthcoming), IPR is an ideal type of EPR. Since a producer is responsible for his own products, we can assume that there would be an incentive for design improvements (in a way that a producer takes the end-of-life into account and balance it with other considerations).

Each producer is independently responsible for managing the e-waste generated by their products. The producers announce take-back policies and have contractual agreements with the collection agency which collects the waste from the generator at least free-of-cost. The producers, through the collection agency, however pay a fixed price for their products/ components to the generators, as in the collective responsibility model.

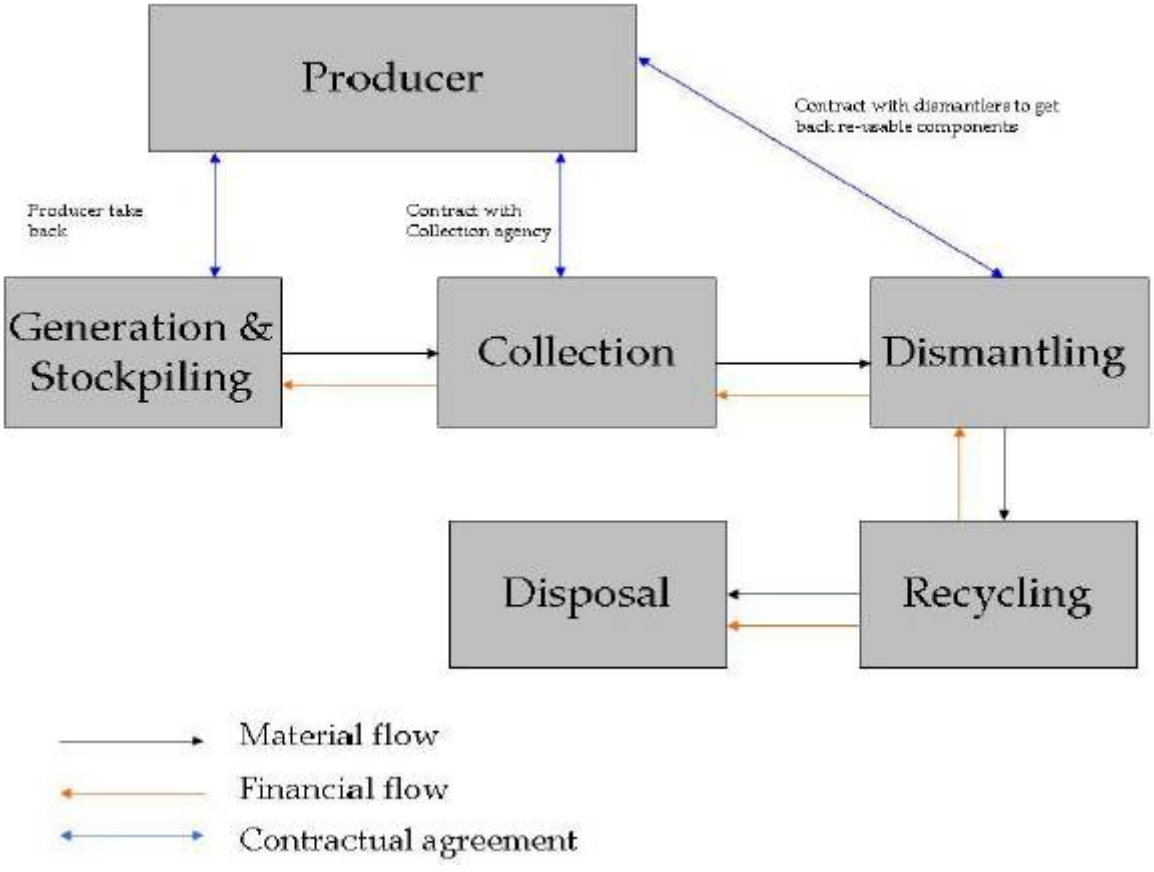

Figure 30: Individual Producer Responsibility Model

The individual producer in this model has the option of having direct contracts with the dismantler and/or the recyclers which allows them to get back the re-usable components from their obsolete computers. The producers can also get the data from the collector/dismantler/ recycler about the specific composition and characteristics of the waste generated by its products in terms of:

Which models are recycled the most?

Which components within the computer are most difficult to dismantle/ recycle?

How can their product be redesigned to make it easier to dismantle and increase the fraction of components which can be reused?

One of the major advantages of having access to information above is the incentive it provides to the individual producer to design for increasing re-use as well as the product design. The economic rationale behind the incentive to redesign is the following: Individual producers, by redesigning their products to facilitate dismantling and increasing re-use of certain components can then transfer the benefits to the consumers who get better prices when they sell off their old computers to the designated collection agency.

Collection

The collection in this model is managed by not-for-profit collection agencies which are regulated by the appropriate authorities like the DPCC and CPCB. The individual producers have contracts with the collection agency and on behalf of the producer; the collection agency implements the producer take back schemes. The collection agency also collects from retailers as well other generators of e-waste through an extensive network of collection centres. As in the model with collective producer responsibility, there is scope for the involvement of the informal sector in the collection and storage of e-waste.

Dismantling and recycling

The roles and responsibilities envisaged for the dismantler and recycler remains the same in both the individual and producer responsibility models. However, in the individual responsibility model, the collection agencies would supply the material to the dismantlers and recyclers and not the collective producer body.

Comments:

The suggested model, which is based on the concept of Individual Producer Responsibility, has the following advantages:

- Market based mechanism: The model allows for the interplay of market forces in determining the price of each category of e-waste generated. It also allows individual producers to negotiate for the “appropriate” price or cost for each category/ brand of waste.
- Eliminates free riders once legislation is introduced: The model also creates a level playing field once appropriate legislation is introduced.
- Individual producer responsibility
- Innovation in production: As described above, the model can allow for designing of efficient recycling as well as dismantling. Such benefits can be passed on to the consumer.
- Efficient design of WEEE Management model by each producer: Each producer has the option of negotiating contracts with other players in the WEEE management system allowing for more flexibility and appropriate mechanism to suit the needs of the producer.

Some of the constraints and bottlenecks of the proposed Individual Responsibility Model are:

- Administrative expenses could be much higher as compared to the collective system due to the presences of duplicated systems and high transaction costs like administering contracts.
- Involvement of informal recyclers into the system would require careful capacity building because certain processes which are an integral part of the value chain of the informal sector are envisaged to be shifted to the formal recycling unit, for instance, no involvement of informal sector in material recovery.
- Uncertainty in provision of the end-of-life costs for complex products

- Its efficiency depends on the collection rate.
- Only e-waste A and C defined in 2.3 are covered in an IPR model and there remains a need to address the problem of waste which doesn't fit in any individual system.

Proposed Collective Producer Responsibility Model

At the heart of this proposed collective e-waste model is the electrical and electronics industry, which comprises of various players in the field. This group contains not only the manufacturers but also the importers and assemblers of the EEE (Electrical and Electronic Equipments). The model recommends a very important role for the manufacturers/producers of electronic goods and proposes that they come together as consortium and establish an organisation, which takes the responsibility of the end-of-life disposal of products being manufactured or assembled by them. This organisation, which can be established with support from all producers, can be designated as 'Producer Responsibility Organisation (PRO)' and will largely be responsible for environmentally sound management of e-waste

There are several factors that make a PRO deem crucial in an EPR programme:

- Small producers might not have enough capacity & power in negotiating the contracts to carry on their responsibility alone
- Economy of scale in the operation
- Managing orphan and historical products
- Assuming monitoring and enforcement role to
    - Reduce transaction costs e.g. by certifying treatment facilities
    - Identifying free riders.

The producers will also enjoy a major advantage of their sales and service network to utilise this channel to collect the waste back at the end of life of such products.

A proposed implementation of a PRO in India is described in the following paragraphs

Structure of PRO: It is suggested that the PRO operates as a non-profit organisation built on the ethos of Corporate Social Responsibility (CSR) and be an active participant in this process. The top management of this PRO should have representation from various sectors making it a truly multi-stakeholder organisation.

The cost of establishing this organisation needs to be supported by the individual companies. The details on the contribution made by individual companies can be worked out through detailed deliberation. A part of revenue can also be generated through the sale of the e-waste being sold to the recycler/dismantler.

The PRO should operate with full operational transparency.

Function of PRO: The Producer Responsibility Organisation will take on overall responsibility of the complete recycling process of e-waste with different levels of engagements in various processes. The PRO will take on direct responsibility of collection and storage of all WEEE generated across the country and then pass this on to the dismantler/recycler for a price. He can outsource these operations (tying up with existing informal sector) but will still be responsible for ensuring proper collection and storage. Also the individual producers can run their own take back systems but have to tie up with the PRO for final disposal and recycling.

Some of the goods being classified as WEEE have an intrinsic material value and this value is an important key to the financial planning of this model. It is a globally accepted fact that lot of e-waste has a material value assigned and all recyclers, big or small, procure electronic wastes at a price and then make profits by selling the recovered materials.

This model suggests and recommends that a part of this material value be passed on to the generators of the waste. Part of this value (revenue) be utilised for logistical support of collection and storage of waste. This mechanism also provides incentive to the generators to be active participants and streamline the storage and collection system to an authorised agency. The PRO will pay the generators for the material collected and provide free collection system. The dynamic fee system for different end-of-life products will be fixed by the PRO and will be open to review at periodic intervals. This will give an option to vary the prices according to the prevailing market values of the materials extracted.

The revenue generated by PRO through sale of this waste to the recyclers will be utilised for financing the take back process from the consumers (cost paid for the WEEE) as well as the collection and storage of the waste. In case of products with no material value and a recycling cost attached, the producer will need to take responsibility (through PRO) as part of the EPR initiative.

Function of recyclers: The collected material will be sold to an authorised (individual or consortium) dismantler and recycler, who is an important component in this e-waste management system. The dismantling and recycling infrastructure will be responsible for establishing environmentally sound technologies to manage WEEE.

The revenue generated through sales of the materials recovered will support the administrative, plant and machinery and other overheads. The critical factor deciding the breakeven period will be both an assured material supply as well as the scale of operation. The experiences across many countries suggest that the scale of operation for recycling such waste is growing and such ventures are considered viable and profitable.

The collection mechanism of the proposed model

1. ***PRO take-back***: The PRO will provide free collection for the waste and the generators will be paid for the material according the product type (fixed by PRO). A proper reporting system has to be established for this to ensure transparency.

2. Dealer take-back: The dealers selling such products will have to take back the old products and the generators will get a discount on new purchase of electrical and electronic goods (the end-of-life cost can be fixed according to product type). These products will be then transferred back to the PRO with proper reporting.

3. By existing informal network: One of the biggest challenges to this model is from the existing informal sector and the operators will need to address this. The best option may be to channelise this sector in the collection and storage of waste from various sources, which is then passed onto authorized distribution channels. The informal sector will tie up with the PRO to ensure accountability.

13. How do you finance EPR in the Indian context?

The financing of the Individual Producer Responsibility Model would depend, amongst other things, on the inherent material value of the EEE. This would be the most crucial element in determining whether another financial instrument, like an Advanced Recycling Fee (ARF) to be levied at the point of sale, is necessary at all. The price, inclusive of ARF, would therefore reflect the true price of the product including the environmental cost of the product. For instance, products like computers which have inherent material value that can cover the entire cost of recycling could potentially be recycled by levying a nominal or even zero ARF. However, products which do not have sufficient material value at the end of useful life will need to be recycled by levying either a visible or invisible ARF. Therefore under the individual responsibility model, there would be a menu of ARF ranging from zero to positive amounts, depending on the inherent material value of the end of life product. The exact amounts would depend on the producers' estimation of the recycling costs and the nature of contracting with the recyclers. If Individual Responsibility is a component of a larger Collective Responsibility Model, the proposed ARF might go down because the collective organization would be able to take advantage of economies of scale

14. Session Plans:

E-Waste Curriculum: Training of Trainers

This curriculum has used Donna E. Walker's 'Learning Cycle' to design each of the sessions. Each step of the Walker's cycle serves a specific purpose thus ensuring that the learning effectiveness is maximized. The details of the five steps of the Walker's Cycle are explained below:

1. Mind Jog: This step helps to start the session on a positive note and arouse curiosity about the issue the session relates to. Mind jogs need to be short and crisp, and lead into the topic.

2. Personal Connection: This step helps to bring out the 'what's in it for me' connection and prepares the participants for absorbing new knowledge. The exercises used at this stage try to make the session relevant to learner's real world 'as is'.

3. Information Exchange: The focus of this stage is to build new knowledge, facilitate exchange of information between and among the participants and deduce some key concepts through discussion and presentation to supplement participants' information. In this stage, the facilitators allow the participants to come up with concepts instead of downloading it for them and allow extensive peer discussion and learning. The facilitators here need to concentrate on refining and building on

participants' inputs.

4. Information Application: The purpose of this stage is to build confidence in the participants about new knowledge, support them to apply the key concepts learnt to realistic scenarios (thereby reconfirming the learning of the previous stages), and to facilitate a multi-perspective view. This stage also seeks to add fresh insights into the concepts and apply the skills to real life situations without taking real risks. For this curriculum, we have tried to ensure that the activities are drawn from the participants' background and experiences and enough complexity has been built into it in order to get a variety of responses.

5. Real World Connection: The activities in this stage seek to elicit personal learning and satisfy the participants that new knowledge will lead to a better performance. The design of this stage enables participants to connect personal learning to learning from the session, as the facilitator helps them set up clear performance oriented goals, which are also specific, measurable and realistic. This way both the facilitators and the participants get a chance to informally assess how effective the participants' learning has been.

Session 1:Labeling Mechanisms in Electronics:

Purpose

This session provides accurate and productive ways to track inventory, production, work -in-process and customer orders in real-time, which prevent employee mistakes such as picking the wrong materials.It will also help in tracking warehouse and stock-room operations and increase responsiveness, improve customer service, and enhance productivity.

Session Objectives

Upon completion of this topic, participants will be able to…

- Explain Bar codes, data matrix codes and purpose of their designing
- Explain the labelling mechanism in electronics
- Explain the guidelines for use of Standard Mark for the Compulsory Registration Scheme of BIS

Summary session plan:

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Connecting with the session objective** Labeling mechanism of electronics**(Prepare a quiz with 6 questions)**	Quiz	20 minutes
Personal Connect	**Reflecting on personal experience as an E-waste manufacturer wrt labelling of electronics during manufacturing** One thing in terms of labelling of electronics as a manufacturer I am doing • Individually reflect and write (10	Individual reflection and group work	30 minutes

	minutes) • In small groups, share (20 minutes)		
Information Exchange	**Defining the concept of labeling**	Film	20 mins.
Information Application	**Identifying different stakeholders** Read aloud the RELEVANT SECTION of the topic and draw how they can implement bar coding for electronic manufacturing • Make 4 small groups • Participants share individual written thoughts in small groups • Each group presents to the larger group the discussion points • The facilitator sums up the discussion by sharing the concept with the participants Based on your understanding of E-waste create a labelling mechanism of electronics manufacturing in your company. This is followed by group presentations and also responses from the participants	Group work	1 hour
Real World Connect	**Exploring the importance of labelling in electronics manufacturing** Self- Assessment on labelling mechanisms in electronics	Individual reflection	15 mins

MIND JOG	**STATE:** Before we begin our session let's take a quick quiz **EXPLAIN:** • Please be ready with a paper and pencil • There will be total six questions • I will not repeat any of the questions • Maintain complete silence till the quiz gets over. You will write the responses to the questions and not speak about it **ASK:** • 'Are you ready?' If they are ready you begin administering the quiz Just wait for about half a minute between each question After asking all the questions then you can discuss the answers Clarify all the answers using the quiz paper
	ASK: How many of you have got more than five? Appreciate them quickly and… **ASK:** What do you think the quiz was about? **EXPLAIN:** • This quiz was about labelling mechanism of electronics
	ASK :

PERSONAL CONNECT	What is your responsibility as an E-Waste Facilitator? EXPLAIN As E-waste facilitator what is your responsibility to uphold the rules and policy of the state
INFORMATION EXCHANGE	Film
INFORMATION APPLICATION	**SAY:** Take a minute to reflect on "One thing in terms of labelling of electronics as a manufacturer I am doing and write down for yourself on a card. *(Give participants 5 minutes for this)* **SAY:** Now, let's get into three groups. Within your groups, take a look at your reflections and as a group capture the actions which are adding to labelling of electronics during manufacturing **INSTRUCT** Will one person from each group share their groups' chart with the larger group? As the groups are sharing, capture what they are saying on a chart or white board **EXPLAIN** Each one of us is responsible for labelling of electronics. Understand the concept and requirement of labelling and how to implement this.
REAL WORLD CONNECT	**Exploring the importance of labelling mechanisms in electronics** Understand the labelling mechanism, its importance from other companies who already involved and implementing this mechanism. Can also explore the companies implementing labelling mechanism in other countries.

Session 1 and Session 2Transition Note:

In the last session we have learnt about the labeling mechanism in electronics manufacturing, its requirement and importance. We also understood how we should develop labeling mechanism for our company. In this session, we will learn about the rules of e-waste in our country.

Session 2:The E-waste (Management) Rules, 2016 and the challenges of implementing the Rules

Purpose

This session seeks to build an understanding of the participants about the policies and rules associated with E-waste in India. The session also helps participants identify the responsibilities of manufactures/ producers in the effective implementation of the rules.

Session Objectives

Upon completion of this topic, participants will be able to…

- Explain the policy, rules and what's new in E-waste (Management) Rules, 2016
- Explain their responsibility of Producers/ Manufacturers
- Identify the challenges in implementing the Rules

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Connecting with the session objective** Quiz about the rules and policies **(Prepare a quiz with 5 questions)**	Quiz	20 minutes
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** My responsibility as an E-waste manufacturer/ Producer	Individual reflection	30 minutes
Information Exchange	**What is new in E-waste (Management) Rules, 2016 and its challenges** Discussion: read aloud the RELEVANT SECTION with participants and find out the way of its implementation	Speakers	1 hour
Information Application	**Identifying different stakeholders** Group processing of the case study to identify the policy /rules for E-Waste • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and bring out new rules and its	Group work	1 hour

	challenges in India • Each group presents to the larger group the rules and challenges based on the given topic . • The facilitator sums up the discussion by sharing the views on rules and challenges with the participants		
Real World Connect 	**Exploring the importance of policy and rules in regulating E-waste** Read about the policies from other countries to do a comparative analysis- Facilitator to give suggested readings.		10 mins

MIND JOG 	**STATE:** Before we begin our session let's take a quick quiz **EXPLAIN:** • Please be ready with a paper and pencil • There will be total five questions • I will not repeat any of the questions • Maintain complete silence till the quiz gets over. You will write the responses to the questions and not speak about it **ASK:** • 'Are you ready?' If they are ready you begin administering the quiz Just wait for about half a minute between each question After asking all the questions then you can discuss the answers Clarify all the answers using the quiz paper **ASK:** How many of you have got more than five? Appreciate them quickly and… **ASK:** What do you think the quiz was about? **EXPLAIN:** • This quiz was about E-Waste
PERSONAL CONNECT 	ASK : What is your responsibility as an E-Waste Facilitator? EXPLAIN As E-waste facilitator what is your responsibility to uphold the rules and policy of the state
INFORMATION EXCHANGE	INSTRUCT Group Discussion

INFORMATION APPLICATION 	INSTRUCT Share the points of discussion
REAL WORLD CONNECT 	Read about the policies from other countries to do a comparative analysis

Session 2 and Session 3

Transition Note:

This session describes the rules that govern the safe disposal of e-waste in India. The next session is on the responsibilities that manufacturers as stakeholders have within the ambit of the rules.

Session 3: Responsibilities of the manufacturer

Purpose

This session seeks to build an understanding of the participants about the policies and rules associated with E-waste in India. The session also helps participants identify the responsibilities of manufactures/ producers in the effective implementation of the rules.

Session Objectives

Upon completion of this topic, participants will be able to…

- Explain the responsibilities of Manufacturers
- Explain the responsibilities of Producers

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Connecting with the session objective** Describe the responsibilities of Manufacturers and producers	Presentation	20 minutes
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** My responsibility as an E-waste manufacturer/ Producer	Individual reflection	30 minutes
Information Exchange	**Form for getting EPR Authorisation** Discussion: describe the FORM 1 and and how to get EPR authorisation	Speakers	1 hour
Information Application	**How to get authorisation for generation or storage or treatment or refurbishing of disposal of e-waste by manufacturers or refurbishers** Group processing of the case study to identify the policy /rules for E-Waste • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and bring out new rules and its challenges in India • Each group presents to the larger group based on the given topic . • The facilitator sums up the discussion by sharing the views on rules and challenges with the participants	Group work	1 hour
Real World Connect	**How to file annual returns (FORM 3)** Discussion: describe the FORM 3 and how to file annual returns	Speakers	30 mins

MIND JOG 	**STATE:** Before we begin our session let's take a quick quiz **EXPLAIN:** • Please be ready with a paper and pencil • There will be total five questions • I will not repeat any of the questions • Maintain complete silence till the quiz gets over. You will write the responses to the questions and not speak about it **ASK:** • 'Are you ready?' If they are ready you begin administering the quiz Just wait for about half a minute between each question After asking all the questions then you can discuss the answers Clarify all the answers using the quiz paper **ASK:** How many of you have got more than five? Appreciate them quickly and… **ASK:** What do you think the quiz was about? **EXPLAIN:** • This quiz was about E-Waste
PERSONAL CONNECT 	ASK : What is your responsibility as an E-Waste Facilitator? EXPLAIN As E-waste facilitator what is your responsibility to uphold the rules and policy of the state
INFORMATION EXCHANGE 	INSTRUCT Share the points of group discussion
INFORMATION APPLICATION	INSTRUCT Share the points of group discussion

REAL WORLD CONNECT	Presentation by speaker

Session 3 and Session 4

Transition Note:

This session we learnt about the responsibilities of manufacturers. We will now try and understand what are the building blocks to an internal policy of e-waste in an organization.

Session 4:Building blocks to an internal policy on e-waste management

Purpose

To comply with the India e-waste rule 2016, companies need to work on their only policy framework to ensure the compliance of its products to these new initiatives and directives.

Session Objectives

Upon completion of this topic, participants will be able to…

- Explain the way of implementing the policy
- Explain the monitoring of implementation
- Explain how to organize collection, storage and disposal

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Connecting with the session objective** Describe the implementation of the policyand monitoring the progress of implementation process • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and bring out the implementation process of policy and monitoring • Each group presents to the larger group on the given topic . The facilitator sums up the discussion by sharing the views on the implementation of the policyand monitoring with the participants	Group discussion	1 hour
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** How do we monitor the progress of our implementation process	Individual reflection	30 minutes
Information Exchange	**Various national and international best practices** Discussion: various existing case studies/ examples	Speakers	15 min
Information Application	**Steps to be taken for implementation of internal policy on e-waste management by manufacturers or refurbishers**	Group work	30 min
Real World Connect	**Challenges in implementation of internal policy on e-waste management by manufacturers or refurbishers**	Speakers	30 mins
MIND JOG	Group processing of the case study to identify the policy /rules for E-Waste • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and bring out new rules and		

	its challenges in India • Each group presents to the larger group the rules and challenges based on the given topic . The facilitator sums up the discussion by sharing the views on the given topic with the participants
PERSONAL CONNECT 	ASK : How do we monitor the progress of our implementation process EXPLAIN As E-waste manufacturerprovide the way of monitoring the progress of implementation process
INFORMATION EXCHANGE 	INSTRUCT Presentation
INFORMATION APPLICATION 	INSTRUCT Group processing of the case study to identify the policy /rules for E-Waste • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and bring out new rules and its challenges in India • Each group presents to the larger group the rules and challenges based on the given topic. The facilitator sums up the discussion by sharing the views on the given topic with the participants
REAL WORLD CONNECT 	Presentation by speaker

Session 4 and Session 5

Transition Note:

This session we learnt about the building blocks of an internal policy on e-waste for an organisation. We shall now move to understanding the guidelines for setting up collection center for e-waste.

Session 5:Guidelines for setting up of collection centres of e-waste:

Purpose

To comply with the India e-waste rule 2016, companies need to work on setting up of collection centers for e-waste for proper collection, transportation, storage and handling of E-Waste

Session Objectives

Upon completion of this topic, participants will be able to…

- Explain the safe management of e-waste in terms of collection, transportation and storage
- Explain the legal requirement for setting up e-waste collection centre

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Connecting with the session objective** Describe the guidelines for setting up e-waste collection centres	Presentation	30 minutes
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** How do we initiate collection centre of e-waste	Individual reflection	30 minutes
Information Exchange	**Legal requirement for setting up collection centre for e-waste**	Presentation	15 min

Information Application	**Steps to be taken for setting up collection centre for e-waste**	Group work	30 min
Real World Connect	**Challenges in implementation of for setting up collection centre for e-waste**	Speakers	15 mins

MIND JOG	Presentation to describe the guidelines for setting up e-waste collection centres
PERSONAL CONNECT	ASK : How do we initiate collection centre of e-waste EXPLAIN As E-waste manufacturerprovide the way to initiate collection centre of e-waste
INFORMATION EXCHANGE	INSTRUCT Presentation
INFORMATION APPLICATION	INSTRUCT Group processing steps to be taken for setting up E-Waste collection centre • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and steps which can be taken for setting up collection centre for e-waste • Each group presents to the larger group about steps which can be taken for setting up collection centre for e-waste The facilitator sums up the discussion by sharing the views on the given topic with the participants

REAL WORLD CONNECT	Presentation by speaker

Session 5 and Session 6

Transition Note:

This session helped us understand on how we can build guidelines for setting up a collection center for e-waste. The next session will help to understand how a PRO can be set up for e-waste management by manufacturers.

Session 6:How do you set up of a Producer Responsibility Organization (PRO) for collecting e-waste:

Purpose

To comply with the India e-waste rule 2016, companies need to work on setting up of collection centers for e-waste for proper collection, transportation, storage and handling of E-Waste

Session Objectives

Upon completion of this topic, participants will be able to…

- Able to learn elements and processes of the PRO to account for its actions to stakeholders, members, management

- Detailing the management processes and systems supporting day-to-day activities and the overall accountability framework

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Steps for setting up PRO** Read the RELEVANT SECTION of the topic and draw how they can implement to set up PRO	Case Study and group work	1 hour
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** How do we implement PRO	Presentation	1 hour
Information Exchange	**Legal Implications while setting up PRO**	Presentation	15 min
Information Application	**How to do reporting, monitoring and evaluation of PRO**	Presentation	30 min
Real World Connect	**Case Studies and Best practices for setting up PRO**	Presentation	15 mins

MIND JOG	Presentation to describe steps for setting up PRO
PERSONAL CONNECT	ASK : How do we implement PRO EXPLAIN As E-waste manufacturer provide the way to implement PRO

INFORMATION EXCHANGE 	INSTRUCT Presentation
INFORMATION APPLICATION 	INSTRUCT Group processing steps to be taken for setting up PRO • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and steps which can be taken for setting up collection centre for e-waste • Each group presents to the larger group about steps which can be taken for setting up PRO The facilitator sums up the discussion by sharing the views on the given topic with the participants
REAL WORLD CONNECT 	Presentation by speaker

Session 6 and Session 7

Transition Note:

This session introduced the nuances of setting up a PRO for e-waste management by manufacturers. The next session we will try and understand how manufacturers can work with the informal sector for setting up collection systems.

Session 7:How can you work with the informal sector for e-waste collection?:

Purpose

To comply with the India e-waste rule 2016, companies need to work with informal sector for proper collection of E-Waste

Session Objectives

Upon completion of this topic, participants will be able to…

- Able to learn current scenario of e-waste collection in the country
- How the gap can be bridged between informal sector and formal sector
- Producer responsibility in e-waste collection
- Various model of formalization of informal sector

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**Scenerio of e-waste collection in the country** Presenter will explain the current e-waste collection in the country	Presentation	1 hour
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** Draw the financial incentives and Govt. support	Group discussion	30 min.
Information Exchange	**Steps taken by Producers**	Group discussion	15 min

Information Application	**Various models to explain formalisation of informal sector**	Presentation	30 min
Real World Connect	**How producer can initiate for e-waste collection by involving informal sector**	Group discussion	30 min

MIND JOG	Presentation to describe scenario of e-waste in the country
PERSONAL CONNECT	ASK : As a producer/ manufacturer, how do we initiate a model for informal sector formalisation EXPLAIN As E-waste manufacturer Draw the financial incentives and Govt. support
INFORMATION EXCHANGE	INSTRUCT Group processing steps to be taken for setting up PRO • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and steps taken by producers till now for e-waste collection • Each group presents to the larger group about steps which can be taken for e-waste collection The facilitator sums up the discussion by sharing the views on the given topic with the participants

INFORMATION APPLICATION	Presentation by speaker
REAL WORLD CONNECT	INSTRUCT Group processing steps to be taken for how producer can initiate e-waste collection by involving informal sector • Make 4 small groups • Participants share individual written thoughts in small groups As a group discuss the topic - how producer can initiate e-waste collection by involving informal sector • Each group presents to the larger group The facilitator sums up the discussion by sharing the views on the given topic with the participants

Session 7 and Session 8

Transition Note:

This session helped us envisage options of working with the informal sector on e-waste collection mechanisms. In the next session we shall try and understand how EPR plans can be drawn up by manufacturers under the ambit of the rules.

Session 8:How to make EPR plans?

Purpose

To comply with the India e-waste rule 2016, companies need to make EPR plans and submit the same to CPCB

Session Objectives

Upon completion of this topic, participants will be able to…

- Able to learn how to make EPR plan for their company
- Various models to implement EPR plans

Summary session plan

Flow Step	Description	Methodology/Tools	Duration
Mind Jog	**How to make EPR Plans** Various models for EPR Plans	Presentation	1 hour
Personal Connect	**Reflecting on personal responsibility as an E-waste manufacturer/ Producer** What is the Producer's role	Presentation	30 min
Information Exchange	**Steps taken by Producers**	Group discussion	30 min
Information Application	**How do you finance EPR in Indian Context**	Group discussion	1 hr.
Real World Connect	**Steps to be taken by Producers**	Group discussion	30 min

MIND JOG	Presentation to describe EPR Plans
PERSONAL CONNECT	ASK : How do we implement EPR Plans EXPLAIN Producer's role in EPR Plans

INFORMATION EXCHANGE 	INSTRUCT Steps taken by Producers Group processing steps to be taken for EPR Plans • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and steps which can be taken for setting up collection centre for e-waste • Each group presents to the larger group about steps which can be taken for EPR Plans The facilitator sums up the discussion by sharing the views on the given topic with the participants
INFORMATION APPLICATION 	INSTRUCT Group processing steps for financing EPR Plans • Make 4 small groups • Participants share individual written thoughts in small groups • As a group discuss the topic and steps which can be taken for setting up collection centre for e-waste • Each group presents to the larger group about steps which can be taken for financing EPR Plans The facilitator sums up the discussion by sharing the views on the given topic with the participants
REAL WORLD CONNECT 	Discussion Points for steps to be taken by producers

15. Additional Awareness Materials and Sources of Information / References:

For Manufacturers:

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http://greene.gov.in/wp-content/uploads/2019/08/2019082625.pdf
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Resource Consumption (what is the rate of resource consumption? Any specifics with respect to e-waste? What are the estimates of resources that we consume in electronic substances that are left on earth?)

Environment Alert Bulletin of UNEP: E-waste, the hidden side of IT equipment's manufacturing and use
http://www.grid.unep.ch/products/3_Reports/ew_ewaste.en.pdf

UNEP, International Panel for Resource Management: Assessing the Environmental Impacts of Consumption and Production Priority Products and Materials
http://www.unep.org/resourcepanel/Portals/24102/PDFs/PriorityProductsAndMaterials_Report.pdf

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http://www.eea.europa.eu/downloads/9bd09b51e60d494688adb509a5d5f4e9/1412162610/the-economy-resource-efficient-green.pdf

Article I Energy consumption growth rate of China's electronic manufacturing industry gradually decline
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Manufacturing resource productivity; June 2012 | by Stephan Mohr, Ken Somers, Steven Swartz, and Helga Vanthournout
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Khaliq Abdul, Akbar Rhamdhani Muhammad, Brooks Geoffrey and Masood Syed; Resources 2014, 3, 152-179; doi:10.3390/resources3010152: Metal Extraction Processes for Electronic Waste and Existing Industrial Routes: A Review and Australian Perspective
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Output Australia | October 2011| Page 9; Secondary copper processing – a more sustainable solution
http://www.outotec.com/imagevaultfiles/id_567/cf_2/secondary_copper_processing.pdf

UNEP Report on Sustainable Innovation and Technology Transfer Industrial Sector Studies: RECYCLING – FROM E-WASTE TO RESOURCES
http://www.unep.org/pdf/Recycling_From_e-waste_to_resources.pdf

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http://www.cpcb.nic.in/ImplimentationE-Waste.pdf

Integrated Solid waste management Policy, 2012 by BBMP:
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Capacity Building Opportunities and End of Life Management Criteria for a Voluntary Consensus Standard
https://greenelectronicscouncil.org/wp-content/uploads/2018/11/GEC-CRB-Capacity-Building-Opportunities-Report-FINAL-Oct-2018.pdf

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What to look for when buying material to reduce obsolescence rates

Article by James Carbone, 2012: Buyers Need Strategies to Manage Obsolete Parts Managing component obsolescence requires strong relationships with semiconductor suppliers
http://www.digikey.com/en/articles/techzone/2012/aug/buyers-need-strategies-to-manage-obsolete-parts

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http://www.afd.fr/jahia/webdav/site/afd/shared/PORTAILS/SECTEURS/CLIMAT/Carbon%20footprint%20user%20manual%20v1.3.pdf

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PRO

How do you set up of a Producer Responsibility Organization (PRO) for collecting e-waste:

Steps for Setting Up a Producer Responsibility Organization by Dr. Ashish Chaturvedi, Senior Technical Advisor, GIZ-IGEP

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List of Abbreviations

MeitY: Ministry of Electronics and Information Technology
MAIT: Manufacturers Association for Information Technology
LOHAS: Lifestyles for Health and Sustainability
e-waste: Electronic Waste
RWAs: Resident Welfare Associations
EPR: Extended Producer Responsibility
PPP: Purchasing Power Parity
TV: Television
CRT: Cathode Ray Tube
LCD: Liquid Crystal Display
LED: Light Emitting Diode
CPCB: Central Pollution Control Board
PVC: Polyvinyl Chloride
PCBs: Polychlorinated Biphenyls
TSDF: Treatment, Storage and Disposal Facility
BFR: Brominated Flame Retardants
PBB: Polybrominated Biphenyls
PBDE: Polybrominated Diphenyl Ethers
ATM: Automated Teller Machine
WEEE: Waste Electrical and Electronic Equipment
CFC: Chlorofluorocarbon
HCFC: Hydrochlorofluorocarbons
HFC: Hydroflourocarbon
HC: Hydrocarbon
UNEP: United Nations Environment Programme
DRS: Deposit Refund Scheme
PRO: Producer Responsibility Organisation
OHS: Occupational Health and Safety
PCDD/Fs: Polychlorinated dibenzo-p-dioxins
PBDD/Fs: Polybrominated dibenzo-p-dioxins
CO2: Carbon Dioxide
IEC: Information, Education and Communication

Annexure- 1

'Standard Mark’ for the Registration Scheme

रजिस्ट्री सं० डी० एल०-33004/99 REGD. NO. D. L.-33004/99

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MINISTRY OF CONSUMER AFFAIRS, FOOD AND PUBLIC DISTRIBUTION

(Department of Consumer Affairs)

(BUREAU OF INDIAN STANDARDS)

New Delhi, the 1st December, 2015

S.O. 3240(E).—In pursuance of sub-rule (1) of the Rule 9 and sub-rule (1) of the Rule 16F of the Bureau of Indian Standards Rules, 1987, the Bureau of Indian Standards hereby notifies the Standard Marks, for the Indian Standards given in the schedule. The use of the Standard Marks as at column (2) below shall denote the use of the words "Self declaration -- Conforming to IS….." mentioned in sub-rule (1) of the Rule 16F of the Bureau of Indian Standards Rules, 1987.

SCHEDULE

Sl. No.	Design of the Standard Mark	Product/Class of Product	Indian Standard	Effective Date
(1)	(2)	(3)	(4)	(5)
1.	IS 302-2-25 R-XXXXXXXX	1. Microwave Ovens	IS 302-2-25	01 December, 2015

2.	IS 302-2-26 R-XXXXXXXX	1. Electronic Clocks with Mains Power	IS 302-2-26	01 December, 2015
3.	IS 616/IEC 60065 R-XXXXXXXX	1. Plasma/LCD/LED Televisions of screen size 32" and above 2. Power Adaptors for Audio, Video & Similar Electronic Apparatus 3. Amplifiers with input power 2000W and above 4. Electronic Musical Systems with input power 200W and above 5. Optical Disc Players with built in amplifiers of input power 200W and above 6. Electronic Games (Video)	IS 616 / IEC 60065	01 December, 2015
4.	IS 10322 (Part 5/Sec 1) R-XXXXXXXX	1. Fixed General Purpose LED Luminaires	IS 10322 (Part 5/Sec 1)	01 December, 2015
5.	IS 13252 (Part 1)/ IEC 60950-1 R-XXXXXXXX	1. Point of Sale Terminals 2. Power Adaptors for IT Equipment 3. Automatic Data Processing Machine 4. Laptop/ Notebook/Tablet 5. Power Banks for use in portable applications	IS 13252(Part 1)/ IEC 60950-1	01 December, 2015

		6. Mobile Phones 7. Printers, Plotters 8. Cash Registers 9. Copying Machines/ Duplicators 10. Smart Card Readers 11. Mail Processing Machines/Postage Machines/Franking Machines 12. Passport Reader 13. Set Top Box 14. Telephone Answering Machines 15. Scanners 16. Wireless Keyboards 17. Visual Display Units, Video Monitors of screen size 32" and above		
6.	IS 15885 (Part 2/Sec 13) R-XXXXXXXX	1. DC or AC Supplied Electronic Controlgear for LED Modules	IS 15885 (Part 2/Sec 13)	01 December, 2015
7.	IS 16046/IEC 62133 R-XXXXXXXX	1. Sealed Secondary Cells/Batteries containing Alkaline or other non-acid electrolytes for use in portable applications	IS 16046/ IEC 62133	01 December, 2015
8.	IS 16102 (Part 1) R-XXXXXXXX	1. Self-Ballasted LED Lamps for general Lighting Services	IS 16102 (Part 1)	01 December, 2015

9.	IS 16242 (Part 1)/ IEC 60240-1	1. UPS/Invertors of rating ≤ 5kVA	IS 16242 (Part-1)/ IEC 60240-1	01 December, 2015

Note : R-XXXXXXXX below the Standard Mark denotes the 8 digit Registration Number

[F. No. CMD-3/8:1]

ALKA PANDA, Director General, BIS

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Annexure II

[PUBLISHED IN THE GAZETTE OF INDIA, EXTRAORDINARY PART-II, SECTION- 3, SUB-SECTION (i)]

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 23rd March , 2016

G.S.R 338(E). - Whereas the draft rules, namely the e-waste (Management) Rules, 2015, were published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* number G.S.R. 472(E), dated the 10th June, 2015 in the Gazette of India, Extraordinary Part II, section 3, sub-section (ii) inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS the copies of the Gazette containing the said notification were made available to the public on the 10th day of June, 2015;

AND WHEREAS the objections and suggestions received within the specified period from the public in respect of the said draft rules have been duly considered by the Central Government;

NOW, THEREFORE, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the e- waste (Management and Handling) Rules, 2011, published in the Gazette of India, section 3, sub-section (ii), *vide* number S.O. 1035(E), dated the 12th May, 2011, except as respects things done or omitted to be done before such supersession, the Central Government hereby makes the following rules, namely:-

CHAPTER I

PRELIMINARY

1. Short title and commencement. - (1) These rules may be called the E-Waste (Management) Rules, 2016.
(2) They shall come into force from the 1st day of October, 2016.

2. Application. - These rules shall apply to every manufacturer, producer, consumer, bulk consumer, collection centres, dealers, e-retailer, refurbisher**,** dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment listed in Schedule I, 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, 2001 made under the Act;
(b) micro enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 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.

3. Definitions. - (1) In these rules, unless the context otherwise requires, -

(a) 'Act' means the Environment (Protection) Act, 1986 (29 of 1986);
(b) 'authorisation' means permission for generation, handling, collection, reception, storage, transportation, refurbishing, dismantling, recycling, treatment and disposal of e-waste, granted to manufacturer, dismantler, refurbisher and recycler;
(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 organisations, international agencies, partnership and public or private companies that are registered under the Factories Act, 1948 (63 of 1948) and the Companies Act, 2013 (18 of 2013) and health care facilities which have turnover of more than one crore or have more than twenty employees;
(d) 'Central Pollution Control Board' means the Central Pollution Control Board constituted under sub-section (1) of section 3 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);
(e) 'collection centre' means a centre or a collection point or both established by producer individually or as association jointly to collect e-waste for channelising the e-waste to recycler and play such role as indicated in the authorisation for Extended Producer Responsibility granted to the producer and having facilities as per the guidelines of Central Pollution Control Board, including the collection centre established by the dismantler or refurbisher or recycler which should be a part of their authorisation issued by the State Pollution Control Board where the facility exists;
(f) ‘component’ means one of the parts of a sub-assembly or assembly of which a manufactured product is made up and into which it may be resolved and includes an accessory or attachment to another component;

(g) ‘consumables’ means an item, which participates in or is required for a manufacturing process or for functioning of the electrical and electronic equipment and may or may not form part of end-product. Items, which are substantially or totally consumed during a manufacturing process, shall be deemed to be consumables;
(h) 'consumer' means any person using electrical and electronic equipment excluding the bulk consumers;
(i) ‘channelisation’ means to direct the path for movement of e-wastes from collection onwards to authorised dismantler or recycler. In case of fluorescent and other mercury containing lamps, where recyclers are not available, this means path for movement from collection centre to Treatment, Storage and Disposal Facility;
(j) 'dealer' means any individual or firm that buys or receives electrical and electronic equipment as listed in Schedule I of these rules and their components or consumables or parts or spares from producers for sale;
(k) ‘deposit refund scheme’ means a scheme whereby the producer charges an additional amount as a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of-life electrical and electronic equipment is returned;
(l) 'dismantler' means any person or organisation engaged in dismantling of used electrical and electronic equipment into their components and having facilities as per the guidelines of Central Pollution Control Board and having authorisation from concerned State Pollution Control Board;
(m) 'disposal' means any operation which does not lead to recycling, recovery or reuse and includes physico-chemical or biological treatment, incineration and deposition in secured landfill;
(n) ‘end-of-life’ of the product means the time when the product is intended to be discarded by the user;
(o) '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 such e-waste;
(p) 'electrical and electronic equipment' means equipment which are dependent on electric current or electro-magnetic field in order to become functional;
(q) ‘e-retailer’ means an individual or company or business entity that uses an electronic network such as internet, telephone, to sell its goods;
(r) 'e-waste' means electrical and electronic equipment**,** whole or in part discarded as waste by the consumer or bulk consumer as well as rejects from manufacturing, refurbishment and repair processes;
(s) ‘e-waste exchange’ means an independent market instrument offering assistance or independent electronic systems offering services for sale and purchase of e-waste generated from end-of-life electrical and electronic equipment between agencies or organisations authorised under these rules;
(t) ‘Extended Producer Responsibility’ means responsibility of any producer of electrical or electronic equipment, for channelisation of e-waste to ensure environmentally sound management of such waste. Extended Producer Responsibility may comprise of implementing take back system or setting up of collection centres or both and having agreed arrangements with authorised dismantler or recycler either individually or collectively through a Producer Responsibility Organisation recognised by producer or producers in their Extended Producer Responsibility - Authorisation;
(u) ‘Extended Producer Responsibility - Authorisation’ means a permission given

by Central Pollution Control Board to a producer, for managing Extended Producer Responsibility with implementation plans and targets outlined in such authorisation including detail of Producer Responsibility Organisation and e-waste exchange, if applicable;

(v) ‘Extended Producer Responsibility Plan’ means a plan submitted by a producer to Central Pollution Control Board, at the time of applying for Extended Producer Responsibility - Authorisation in which a producer shall provide details of e-waste channelisation system for targeted collection including detail of Producer Responsibility Organisation and e-waste exchange, if applicable;

(w) 'facility' means any location wherein the process incidental to the collection, reception, storage, segregation, refurbishing, dismantling, recycling, treatment and disposal of e-waste are carried out;

(x) 'Form' means a form appended to these rules;

(y) ‘historical e-waste’ means e-waste generated from electrical and electronic equipment as specified in Schedule I, which was available on the date from which these rules come into force;

(z) ‘manufacturer’ means a person or an entity or a company as defined in the Companies Act, 2013 (18 of 2013) or a factory as defined in the Factories Act, 1948 (63 of 1948) or Small and Medium Enterprises as defined in Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006), which has facilities for manufacture of electrical and electronic equipment;

(aa) ‘orphaned products’ means non-branded or assembled electrical and electronic equipment as specified in Schedule I or those produced by a company, which has closed its operations;

(bb) ‘part’ means an element of a sub-assembly or assembly not normally useful by itself, and not amenable to further disassembly for maintenance purposes. A part may be a component, spare or an accessory;

(cc) ‘producer’ means any person who, irrespective of the selling technique used such as dealer, retailer, e-retailer, etc.;

(i) manufactures and offers to sell electrical and electronic equipment and their components or consumables or parts or spares under its own brand; or

(ii) offers to sell under its own brand, assembled electrical and electronic equipment and their components or consumables or parts or spares produced by other manufacturers or suppliers; or

(iii) offers to sell imported electrical and electronic equipment and their components or consumables or parts or spares;

(dd) ‘Producer Responsibility Organisation’ means a professional organisation authorised or financed collectively or individually by producers, which can take the responsibility for collection and channelisation of e-waste generated from the ‘end-of-life’ of their products to ensure environmentally sound management of such e-waste;

(ee) ‘recycler’ - means any person who is engaged in recycling and reprocessing of waste electrical and electronic equipment or assemblies or their components and having facilities as elaborated in the guidelines of Central Pollution Control Board;

(ff) 'refurbishment' means repairing of used electrical and electronic equipment as listed in Schedule I for extending its working life for its originally intended use and selling the same in the market or returning to owner;

(gg) 'refurbisher' for the purpose of these rules, means any company or undertaking registered under the Factories Act, 1948 or the Companies Act, 1956 or both or district industries centre engaged in refurbishment of used

electrical and electronic equipment;

(hh) 'Schedule' means the Schedule appended to these rules;

(ii) "spares" means a part or a sub-assembly or assembly for substitution which is ready to replace an identical or similar part or sub-assembly or assembly including a component or an accessory;

(jj) 'State Government in relation to an Union territory means, the Administrator thereof appointed under article 239 of the Constitution;

(kk) 'State Pollution Control Board' means the concerned State Pollution Control Board or the Pollution Control Committee of the Union Territories constituted under sub-section (1) of section 4 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);

(ll) 'target' means the quantity of e-waste to be collected by the producer in fulfilment of Extended Producer Responsibility;

(mm) 'transporter' means a person or company or entity engaged in the off-site transportation of e-waste by air, rail, road or water carrying a manifest system issued by the person or company or entity who has handed over the e-waste to the transporter, giving the origin, destination and quantity of the e-waste being transported;

(2) Words and expressions used in these rules and not defined but defined in the Act shall have the meanings respectively assigned to them in the Act.

CHAPTER II

RESPONSIBILITIES

4. Responsibilities of the manufacturer. - (1) collect e-waste generated during the manufacture of any electrical and electronic equipment and channelise it for recycling or disposal;

(2) apply for an authorisation in Form 1 (a) in accordance with the procedure prescribed under sub-rule (2) of rule 13 from the concerned State Pollution Control Board, which shall give the authorisation in accordance with Form 1 (bb);

(3) ensure that no damage is caused to the environment during storage and transportation of e-waste;

(4) maintain records of the e-waste generated, handled and disposed in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board;

(5) file annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates.

5. Responsibilities of the producer. - The producer of electrical and electronic equipment listed in Schedule I shall be responsible for -

(1) implementing the Extended Producers Responsibility with the following frameworks, namely:-

(a) collection and channelisation of e-waste generated from the 'end-of-life' of their products or 'end-of-life' products with same electrical and electronic equipment code and historical waste available on the date from which these rules come into force as per Schedule I in line with the targets prescribed in Schedule III in Extended Producer Responsibility - Authorisation;

(b) the mechanism used for channelisation of e-waste from 'end-of-life' products including those from their service centres to authorised dismantler or recycler shall be in accordance with the Extended Producer Responsibility - Authorisation. In cases of fluorescent and other mercury containing lamps, where recyclers are not available, channelisation may be from collection centre to Treatment, Storage and Disposal Facility;

(c) for disposal in Treatment, Storage and Disposal Facility, a pre-treatment is necessary to immobilise the mercury and reduce the volume of waste to be disposed off;

(d) Extended Producer Responsibility - Authorisation should comprise of general scheme for collection of waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier, such as through dealer, collection centres, Producer Responsibility Organisation, through buy-back arrangement, exchange scheme, Deposit Refund System, etc. whether directly or through any authorised agency and channelising the items so collected to authorised recyclers;

(e) providing contact details such as address, e-mail address, toll-free telephone numbers or helpline numbers to consumer(s) or bulk consumer(s) through their website and product user documentation so as to facilitate return of end-of-life electrical and electronic equipment;

(f) creating awareness through media, publications, advertisements, posters, or by any other means of communication and product user documentation accompanying the equipment, with regard to -

(i) information on address, e-mail address, toll-free telephone numbers or helpline numbers and web site;
(ii) information on hazardous constituents as specified in sub-rule 1 of rule 16 in electrical and electronic equipment;
(iii) information on hazards of improper handling, disposal, accidental breakage, damage or improper recycling of e-waste;
(iv) instructions for handling and disposal of the equipment after its use, along with the Do's and Don'ts;
(v) affixing a visible, legible and indelible symbol given below on the products or product user documentation to prevent e-waste from being dropped in garbage bins containing waste destined for disposal;

(vi) means and mechanism available for their consumers to return e-waste for recycling including the details of Deposit Refund Scheme, if applicable;

(g) the producer shall opt to implement Extended Producer Responsibility individually or collectively. In individual producer responsibility, producer may set up his own collection centre or implement take back system or both to meet Extended Producer Responsibility. In collective system, producers may tie-up as a member with a Producer Responsibility Organisation or with e-waste exchange or both. It shall be mandatory upon on the individual producer in every case to seek Extended Producer Responsibility - Authorisation from Central Pollution Control Board in accordance with the Form-1 and the procedure laid down in sub-rule (1) of rule 13;

(2) to provide information on the implementation of Deposit Refund Scheme to ensure collection of end-of-life products and their channelisation to authorised dismantlers or recyclers, if such scheme is included in the Extended Producer Responsibility Plan.

Provided that the producer shall refund the deposit amount that has been taken from the consumer or bulk consumer at the time of sale, along with interest at the prevalent rate for the period of the deposit at the time of take back of the end-of-life product;

(3) the import of electrical and electronic equipment shall be allowed only to producers having Extended Producer Responsibility authorisation;

(4) maintaining records in Form-2 of the e-waste handled and make such records available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;

(5) filing annual returns in Form-3, to the Central Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. In case of the Producer with multiple offices in a State, one annual return combining information from all the offices shall be filed;

(6) the Producer shall apply to the Central Pollution Control Board for authorisation in Form 1, which shall thereafter grant the Extended Producer Responsibility - Authorisation in Form 1(aa).

(7) Operation without Extended Producer Responsibility-Authorisation by any producer, as defined in this rule, shall be considered as causing damage to the environment.

6. Responsibilities of collection centres. - (1) collect e-waste on behalf of producer or dismantler or recycler or refurbisher including those arising from orphaned products;

Provided the collection centres established by producer can also collect e-waste on behalf of dismantler, refurbisher and recycler including those arising from orphaned products

(2) ensure that the facilities are in accordance with the standards or guidelines issued by Central Pollution Control Board from time to time;

(3) ensure that the e-waste collected by them is stored in a secured manner till it is sent to authorised dismantler or recycler as the case may be;

(4) ensure that no damage is caused to the environment during storage and transportation of e-waste;

(5) maintain records in Form-2 of the e-waste handled as per the guidelines of Central Pollution Control Board and make such records available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board as and when asked for.

7. Responsibilities of dealers. – (1) in the case the dealer has been given the responsibility of collection on behalf of the producer, 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 as designated by producer;

(2) the dealer or retailer or e-retailer shall refund the amount as per take back system or Deposit Refund Scheme of the producer to the depositor of e-waste;

(3) every dealer shall ensure that the e-waste thus generated is safely transported to authorised dismantlers or recyclers;

(4) ensure that no damage is caused to the environment during storage and transportation of e-waste.

8. Responsibilities of the refurbisher. – (1) collect e-waste generated during the process of refurbishing and channelise the waste to authorised dismantler or recycler through its collection centre;

(2) make an application in Form 1(a) in accordance with the procedure laid down in sub-rule (4) of rule 13 to the concerned State Pollution Control Board for grant of one time authorisation;

(a) the concerned State Pollution Control Board shall authorise the Refurbisher on one time basis as per Form 1 (bb) and authorisation would be deemed as considered if not objected to within a period of thirty days;

(b) the authorised Refurbisher shall be required to submit details of e-waste generated to the concerned State Pollution Control Board on yearly basis;

(3) ensure that no damage is caused to the environment during storage and transportation of e-waste;

(4) ensure that the refurbishing process do not have any adverse effect on the health and the environment;

(5) ensure that the e-waste thus generated is safely transported to authorised collection centres or dismantlers or recyclers;
(6) file annual returns in Form-3 to the concerned State Pollution Control Board, on or before the 30th day of June following the financial year to which that return relates;
(7) maintain records of the e-waste handled in Form-2 and such records should be available for scrutiny by the appropriate authority.

9. 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 channelised through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler;
(2) bulk consumers of electrical and electronic equipment listed in Schedule I shall maintain records of e-waste generated by them in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board;
(3) consumers or bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that such end-of-life electrical and electronic equipment are not admixed with e-waste containing radioactive material as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made there under;
(4) bulk consumers of electrical and electronic equipment listed in Schedule I shall file annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. In case of the bulk consumer with multiple offices in a State, one annual return combining information from all the offices shall be filed to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates

10. Responsibilities of the dismantler. - (1)ensure that the facility and dismantling processes are in accordance with the standards or guidelines prescribed by Central Pollution Control Board from time to time;
(2) obtain authorisation from the concerned State Pollution Control Board in accordance with the procedure under sub-rule (3) of rule 13;
(3) ensure that no damage is caused to the environment during storage and transportation of e-waste;
(4) ensure that the dismantling processes do not have any adverse effect on the health and the environment;
(5) ensure that dismantled e-waste are segregated and sent to the authorised recycling facilities for recovery of materials;
(6) ensure that non-recyclable or non-recoverable components are sent to authorised treatment storage and disposal facilities;
(7) maintain record of e-waste collected, dismantled and sent to authorised recycler in Form-2 and make such record available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;
(8) file a return in Form-3, to the concerned State Pollution Control Board as the case may be, on or before 30th day of June following the financial year to which that return relates;
(9) not process any e-waste for recovery or refining of materials, unless he is authorised with concerned State Pollution Control Board as a recycler for refining and recovery of materials;
(10) operation without Authorisation by any dismantler, as defined in this rule, shall be considered as causing damage to the environment.

11. Responsibilities of the recycler. – (1) shall ensure that the facility and recycling processes are in accordance with the standards or guidelines prescribed by the Central Pollution Control Board from time to time;

(2) obtain authorisation from concerned State Pollution Control Board in accordance with the procedure under the sub-rule (3) of rule 13;

(3) ensure that no damage is caused to the environment during storage and transportation of e-waste;

(4) ensure that the recycling processes do not have any adverse effect on the health and the environment;

(5) make available all records to the Central Pollution Control Board or the concerned State Pollution Control Board for inspection;

(6) ensure that the fractions or material not recycled in its facility is sent to the respective authorised recyclers;

(7) ensure that residue generated during recycling process is disposed of in an authorised treatment storage disposal facility;

(8) maintain record of e-waste collected, dismantled, recycled and sent to authorised recycler in Form-2 and make such record available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;

(9) file annual returns in Form-3, to the concerned State Pollution Control Board as the case may be, on or before 30th day of June following the financial year to which that return relates;

(10) may accept waste electrical and electronic equipment or components not listed in Schedule I for recycling provided that they do not contain any radioactive material and same shall be indicated while taking the authorisation from concerned State Pollution Control Board;

(11) operation without Authorisation by any recycler, as defined in this rule, shall be considered as causing damage to the environment.

12. Responsibilities of State Government for environmentally sound management of E-waste. – (1) Department of Industry in State or any other government agency authorised in this regard by the State Government, to ensure earmarking or allocation of industrial space or shed for e-waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters;

(2) Department of Labour in the State or any other government agency authorised in this regard by the State Government shall:

a. ensure recognition and registration of workers involved in dismantling and recycling;
b. assist formation of groups of such workers to facilitate setting up dismantling facilities;
c. undertake industrial skill development activities for the workers involved in dismantling and recycling;
d. undertake annual monitoring and to ensure safety & health of workers involved in dismantling and recycling;

(3) State Government to prepare integrated plan for effective implementation of these provisions, and to submit annual report to Ministry of Environment, Forest and Climate Change.

CHAPTER III

PROCEDURE FOR SEEKING AND GRANT OF AUTHORISATION FOR MANAGEMENT OF E-WASTE

13. Procedure for Seeking and Grant of Authorisation. -

(1) **Extended Producer Responsibility - Authorisation of Producers.** – (i) every producer of electrical and electronic equipment listed in Schedule I, shall make an application for Extended Producer Responsibility - Authorisation within a period of ninety days starting from the date of these rules coming into force in Form-1 to Central Pollution Control Board;

(ii) on receipt of the application complete in all respects, the Central Pollution Control Board will carry out evaluation of the Extended Producer Responsibility Plan and on being satisfied that the producer has detailed out an effective system to manage Extended Producer Responsibility in the country, shall grant Extended Producer Responsibility - Authorisation, in Form 1(aa) within a period of one hundred and twenty days. The Extended Producer Responsibility - Authorisation shall be valid for a period of five years;

This authorisation shall include among others the targeted quantity of e-waste, product code wise, to be collected during the year. The actual target for collection of e-waste for dismantling or recycling will be fixed on the basis of quantity of electrical and electronic equipment, product code wise, placed in the market in the previous years and taking into consideration the average life of the equipment. The estimated quantity of e-waste generated during the current year will be indicated by the producer and the quantity expected to be collected with the collection scheme proposed to be implemented by the producer will be indicated in the Extended Producer Responsibility plan. The Central Pollution Control Board shall fix the targets in accordance with Schedule III.

(iii) the Central Pollution Control Board, after giving reasonable opportunity of being heard to the applicant shall refuse to grant Extended Producer Responsibility – Authorisation;

(iv) in the event of refusal of Extended Producer Responsibility - Authorisation by the Central Pollution Control Board, the producer will forfeit his right to put any Electrical and Electronic Equipment in the market till such time the Extended Producer Responsibility - Authorisation is granted;

(v) the Central Pollution Control Board after grant of Extended Producer Responsibility - Authorisation shall forward the Extended Producer Responsibility Plan to respective State Pollution Control Board for monitoring;

(vi) an application for the renewal of Extended Producer Responsibility-Authorisation shall be made in Form-1 before one hundred and twenty days of its expiry to Central Pollution Control Board. The Central Pollution Control Board may renew the authorisation for a period of five years after receipt of compliance report from the concerned State Pollution Control Board which shall submit the compliance report to Central Pollution Control Board within sixty days from the date of the receipt of the application. In case of non receipt of the compliance report from the State Pollution Control Board within stipulated time period of sixty days, Central Pollution Control Board may renew the Extended Producer Responsibility-Authorisation after examining such case on merit basis, subject to no report of violation of the provisions of the Act or the rules made there under or the conditions specified in the Extended Producer Responsibility - Authorisation;

(vii) every producer of Electrical and Electronic Equipment listed in Schedule I, shall take all steps, wherever required, to comply with the conditions specified in the Extended Producer Responsibility – Authorisation;

(viii) the concerned State Pollution Control Board shall monitor the compliance of Extended Producer Responsibility - Authorisation, take cognizance of any non-compliance and inform Central Pollution Control Board for taking action, as necessary;

(ix) Central Pollution Control Board shall conduct random check and if in its opinion, the holders of the Extended Producer Responsibility - Authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons thereof in writing cancel or suspend the Extended Producer Responsibility - Authorisation issued under these rules for such period as it considers necessary in the public interest and inform the concerned State Pollution Control Board within ten days of cancellation.

(x) the Central Pollution Control Board shall maintain an online register of Extended Producer Responsibility - Authorisation granted with conditions imposed under these rules for environmentally sound management of e-waste, and which shall be accessible to any citizen of the country.

(xi) The producer authorised under the provision of this rule shall maintain records in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the Central Pollution Control Board on or before 30th day of June of every year;

(2) **Authorisation of Manufacturer. –** (i) the manufacturer generating e-waste shall obtain an authorisation from the concerned State Pollution Control Board;

(ii) the manufacturer shall make an application for authorisation, within a period of ninety days from the date of these rules coming into force in Form 1(a) to the concerned State Pollution Control Board for grant of authorisation;

(iii) on receipt of the application complete in all respects for the authorisation, the concerned State Pollution Control Board may, after such enquiry as it considers necessary and on being satisfied that the applicant possesses appropriate facilities, technical capabilities and equipment to handle e-waste safely, grant within a period of one hundred and twenty days an authorisation in Form 1(bb) to the applicant to carry out safe operations in the authorised place only, which shall be valid for a period of five years;

(iv) the concerned State Pollution Control Board after giving reasonable opportunity of being heard to the applicant may refuse to grant any authorisation;

(v) every person authorised under these rules shall maintain the record of e-waste handled by them in Form-2 and prepare and submit to the concerned State Pollution Control Board, an annual return containing the details specified in Form-3 on or before the 30th day of June following the financial year to which that return relates;

(vi) an application for the renewal of an authorisation shall be made in Form-1(a) before one hundred and twenty days of its expiry and the concerned State Pollution Control Board may renew the authorisation for a period of five years after examining each case on merit and subject to the condition that there is no report of violation of the provisions of the Act or the rules made thereunder or the conditions specified in the authorisation;

(vii) manufacturer shall take all steps to comply with the conditions specified in the authorisation;

(viii) the concerned State Pollution Control Board shall maintain an online register of authorisations granted with conditions imposed under these rules for

environmentally sound management of e-waste, and which shall be accessible to any citizen of the country.

(3) **Procedure for grant of authorisation to dismantler or recycler.** - (i) every Dismantler or Recycler of e-waste shall make an application, within a period of one hundred and twenty days starting from the date of coming into force of these rules, in Form-4 in triplicate to the concerned State Pollution Control Board accompanied with a copy of the following documents for the grant or renewal of authorisation, namely:-

(a) consent to establish granted by the concerned State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974, (25 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981(21 of 1981);
(b) certificate of registration issued by the District Industries Centre or any other government agency authorised in this regard;
(c) proof of installed capacity of plant and machinery issued by the District Industries Centre or any other government agency authorised in this behalf;
(d) in case of renewal, a certificate of compliance of effluent and emission standards, treatment and disposal of hazardous wastes as applicable from the concerned State Pollution Control Board or any other agency designated for this purpose:

Provided that any person authorised or registered under the provisions of the Hazardous Wastes (Management, Handling and Transboundary Movements) Rules, 2008, and the E-waste (Management & Handling) Rules, 2011 prior to the date of coming into force of these rules shall not be required to make an application for authorisation till the period of expiry of such authorisation or registration:

(ii) the concerned State Pollution Control Board, on being satisfied that the application is complete in all respects and that the applicant is utilising environmentally sound technologies and possess adequate technical capabilities, requisite facilities and equipment to dismantle or recycle and process e-waste in compliance to the guidelines specified by Central Pollution Control Board from time to time and through site inspection, may grant authorisation to such applicants stipulating therein necessary conditions as deemed necessary for carrying out safe operations in the authorised place only;
(iii) the concerned State Pollution Control Board shall dispose of the application for authorisation within a period of one hundred and twenty days from the date of the receipt of such application complete in all respects;
(iv) the authorisation granted under these rules shall be valid for a period of five years from the date of its issue and shall be accompanied with a copy of the field inspection report signed by that Board indicating the adequacy of facilities for dismantling or recycling of e-waste and compliance to the guidelines specified by Central Pollution Control Board from time to time;
(v) the concerned State Pollution Control Board may refuse, cancel or suspend an authorisation granted under these rules, if it has reasons to believe that the authorised dismantler or recycler has failed to comply with any of the conditions of authorisation, or with any provisions of the Act or rules made thereunder, after giving an opportunity to the dismantler or recycler to be heard and after recording the reasons thereof;
(vi) an application for the renewal of authorisation shall be made in Form - 4 before one hundred and twenty days of its expiry and the concerned State Pollution Control Board may renew the authorisation for a period of five years after

examining each case on merit and subject to the condition that there is no report of violation of the provisions of the Act or the rules made there under or the conditions specified in the authorisation;

(vi) the Dismantler and Recycler shall maintain records of the e-waste purchased, processed in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the concerned State Pollution Control Board on or before 30th day of June of every year;

(vii) the Central Government and the Central Pollution Control Board may issue guidelines for standards of performance for dismantling and recycling processes from time to time.

(4) **Procedure for grant of authorisation to refurbisher.** – (i) every refurbisher of e-waste shall make an application, with in a period of one hundred and twenty days starting from the date of coming into force of these rules, in Form 1 (a) in triplicate to the concerned State Pollution Control Board accompanied with a copy of the following documents for the grant or renewal of authorisation, namely:-

(a) consent to establish granted by the concerned State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974, (25 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (21 of 1981);
(b) certificate of registration issued by the District Industries Centre or any other government agency authorised in this regard;
(c) proof of installed capacity of plant and machinery issued by the District Industries Centre or any other government agency authorised in this behalf.

(ii) the concerned State Pollution Control Board, on being satisfied that the application is complete in all respects and complies with the guidelines prescribed by Central Pollution Control Board from time to time, may grant one time authorisation in Form 1 (bb) to such applicants stipulating therein necessary conditions as deemed necessary for carrying out refurbishing activities in the authorised place only;

(iii) the concerned State Pollution Control Board shall dispose of the application for authorisation within a period of one hundred and twenty days from the date of the receipt of such application complete in all respects;

(iv) the concerned State Pollution Control Board may refuse, cancel or suspend a authorisation granted under these rules, if it has reasons to believe that the authorised refurbisher has failed to comply with any of the conditions of authorisation, or with any provisions of the Act or rules made thereunder, after giving an opportunity to the refurbisher to be heard and after recording the reasons thereof;

(v) the Refurbisher shall maintain records of the e-waste purchased and refurbished in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the concerned State Pollution Control Board on or before 30th day of June of every year.

14. Power to suspend or cancel an authorisation.- (1) The State Pollution Control Board may, if in its opinion, the holder of Manufacturer or Dismantler or Recycler or Refurbisher Authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons thereof in writing

cancel or suspend the authorisation issued under these rules for such period as it considers necessary in the public interest and inform Central Pollution Control Board within ten days of cancellation;

(2) The Central Pollution Control Board, if in its opinion, the holders of the Extended Producer Responsibility- Authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons thereof in writing cancel or suspend the Extended Producer Responsibility- Authorisation issued under these rules for such period as it considers necessary in the public interest and inform State Pollution Control Boards or Pollution Control Committees within ten days of cancellation;

(3) Upon suspension or cancellation of the authorisation, the Central Pollution Control Board or State Pollution Control Board may give directions to the persons whose authorisation has been suspended or cancelled for the safe storage and management of the e-waste and such persons shall comply with such directions.

CHAPTER IV

15. Procedure for storage of e-waste. - Every manufacturer, producer, bulk consumer, collection centre, dealer, refurbisher, dismantler and recycler may store the e-waste for a period not exceeding one hundred and eighty days and shall maintain a record of collection, sale, transfer and storage of wastes and make these records available for inspection:

Provided that the concerned State Pollution Control Board may extend the said period up to three hundred and sixty five days in case the waste needs to be specifically stored for development of a process for its recycling or reuse.

CHAPTER V

REDUCTION IN THE USE OF HAZARDOUS SUBSTANCES IN THE MANUFACTURE OF ELECTRICAL AND ELECTRONIC EQUIPMENT AND THEIR COMPONENTS OR CONSUMABLES OR PARTS OR SPARES

16. Reduction in the use of hazardous substances in the manufacture of electrical and electronic equipment and their components or consumables or parts or spares. – (1) Every producer of electrical and electronic equipment and their components or consumables or parts or spares listed in Schedule I shall ensure that, new Electrical and Electronic Equipment and their components or consumables or parts or spares do not contain Lead, Mercury, Cadmium, Hexavalent Chromium, polybrominated biphenyls and polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers and of 0.01% by weight in homogenous materials for cadmium.

(2) Components or consumables or parts or spares required for the electrical and electronic equipment placed in the market prior to 1st May, 2014 may be exempted from the provisions of sub-rule (1) of rule 16 provided Reduction of Hazardous Substances compliant parts and spares are not available.
(3) The applications listed in Schedule II shall be exempted from provisions of sub-rule (1) of rule 16.
(4) Every producer of applications listed in Schedule II shall ensure that the limits of hazardous substances as given in Schedule II are to be complied.
(5) Every producer shall provide the detailed information on the constituents of the equipment and their components or consumables or parts or spares alongwith a declaration of conformance to the Reduction of Hazardous Substances provisions in the product user documentation.
(6) Imports or placement in the market for new electrical and electronic equipment shall be permitted only for those which are compliant to provisions of sub-rule (1) and sub rule (4) of rule 16.
(7) Manufacture and supply of electrical and electronic equipment used for defence and other similar strategic applications shall be excluded from provisions of sub-rule (1) of rule 16.
(8) Every producer while seeking Extended Producer Responsibility - Authorisation will provide information on the compliance of the provisions of sub-rule (1) of rule 16. This information shall be in terms of self-declaration.
(9) Central Pollution Control Board shall conduct random sampling of electrical and electronic equipment placed on the market to monitor and verify the compliance of Reduction of Hazardous Substances provisions and the cost for sample and testing shall be borne by the Producer. The random sampling shall be as per the guidelines of Central Pollution Control Board.
(10) If the product does not comply with Reduction of Hazardous Substances provisions, the Producers shall take corrective measures to bring the product into compliance and withdraw or recall the product from the market, within a reasonable period as per the guidelines of the Central Pollution Control Board.
(11) Central Pollution Control Board shall publish the methods for sampling and analysis of Hazardous Substances as listed in sub-rule(1) of rule 16 with respect to the items listed in Schedule I and II and also enlist the labs for this purpose.

CHAPTER VI

MISCELLANEOUS

17. Duties of authorities. - Subject to other provisions of these rules, the authorities shall perform duties as specified in Schedule IV.

18. Annual Report. – (1) The concerned State Pollution Control Board shall prepare and submit to the Central Pollution Control Board an annual report with regard to the implementation of these rules by the 30th day of September every year in Form-5.

(2) The Central Pollution Control Board shall prepare the consolidated annual review report on management of e-waste and forward it to the Central Government along with its recommendations before the 30th day of December every year.

19. Transportation of e-waste. –The transportation of e-waste shall be carried out as per the manifest system whereby the transporter shall be required to carry a document (three copies) prepared by the sender, giving the details as per Form-6:

Provided that the transportation of waste generated from manufacturing or recycling destined for final disposal to a treatment, storage and disposal facility shall follow the provisions under Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.

20. Accident reporting.- Where an accident occurs at the facility processing e-waste or during transportation of e-waste, the producer, refurbisher, transporter, dismantler, or recycler, as the case may be, shall report immediately to the concerned State Pollution Control Board about the accident through telephone and e-mail.

21. Liability of manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler.- (1) The manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler shall be liable for all damages caused to the environment or third party due to improper handling and management of the e-waste;

(2) The manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler shall be liable to pay financial penalties as levied for any violation of the provisions under these rules by the State Pollution Control Board with the prior approval of the Central Pollution Control Board.

22. Appeal.- (1) Any person aggrieved by an order of suspension or cancellation or refusal of authorisation or its renewal passed by the Central Pollution Control Board or State Pollution Control Board may, within a period of thirty days from the date on which the order is communicated to him, prefer a appeal in Form 7 to the Appellate Authority comprising of the Environment Secretary of the State.

(2) The Appellate Authority may entertain the appeal after expiry of the said period of thirty days if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

(3) Every appeal filed under this rule shall be disposed of within a period of sixty days from the date of its filing.

23. The collection, storage, transportation, segregation, refurbishment, dismantling, recycling and disposal of e-waste shall be in accordance with the procedures prescribed in the guidelines published by the Central Pollution Control Board from time to time. Implementation of e-waste (Management and Handling) Amendment Rules, 2011 shall be in accordance with the guidelines prescribed by the Central Pollution Control Board from time to time.

24. Urban Local Bodies (Municipal Committee or Council or Corporation) shall ensure that e-waste pertaining to orphan products is collected and channelised to authorised dismantler or recycler.

SCHEDULE I

[See rules 2, 3(j), 3(y), 3(aa) and 3(ff); 5; 9; 11(10); 13 (1) (i), 13 (1) (vii) and 16(1), 16(11)]

Categories of electrical and electronic equipment including their components, consumables, parts and spares covered under the rules

Sr. No.	Categories of electrical and electronic equipment	Electrical and electronic equipment code
i.	**Information technology and telecommunication equipment :**	
	Centralised data processing: Mainframes, Minicomputers	ITEW1
	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2
	Personal Computing: Laptop Computers(Central Processing Unit with input and output devices)	ITEW3
	Personal Computing: Notebook Computers	ITEW4
	Personal Computing: Notepad Computers	ITEW5
	Printers including cartridges	ITEW6
	Copying equipment	ITEW7
	Electrical and electronic typewriters	ITEW8
	User terminals and systems	ITEW9
	Facsimile	ITEW10
	Telex	ITEW11
	Telephones	ITEW12
	Pay telephones	ITEW13
	Cordless telephones	ITEW14
	Cellular telephones	ITEW15
	Answering systems	ITEW16
ii.	**Consumer electrical and electronics:**	
	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1
	Refrigerator	CEEW2
	Washing Machine	CEEW3
	Air-conditioners excluding centralised air conditioning plants	CEEW4
	Fluorescent and other Mercury containing lamps	CEEW5

SCHEDULE II

[See rules 16 (3), 16 (4) and 16 (11)]

Applications, which are exempted from the requirements of sub-rule (1) of rule 16	
	Substance
1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):
1(a)	For general lighting purposes <30 W : 2.5 mg
1(b)	For general lighting purposes ≥ 30 W and <50 W : 3.5mg
1(c)	For general lighting purposes ≥ 50 W and <150 W : 5mg
1(d)	For general lighting purposes ≥150 W : 15 mg
1(e)	For general lighting purposes with circular or square structural shape and tube diameter ≤17 mm : 7mg
1(f)	For special purposes:5 mg
2(a)	Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):
2(a)(1)	Tri-band phosphor with normal life time and a tube diameter < 9mm (e.g. T2): 4mg
2(a)(2)	Tri-band phosphor with normal life time and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg
2(a)(3)	Tri- band phosphor with normal life time and a tube diameter >17 mm and ≤ 28 mm(e.g. T8): 3.5 mg
2(a)(4)	Tri-band phosphor with normal life time and a tube diameter >28 mm (e.g. T 12):3.5 mg
2(a)(5)	Tri-band phosphor with long life time (≥25000 h):5mg
2(b)	Mercury in other fluorescent lamps not exceeding(per lamp):
2(b)(1)	Linear halophosphate lamps with tube >28 mm (e.g. T 10 and T12):10 mg
2(b)(2)	Non-linear halophosphate lamps(all diameters):15mg
2(b)(3)	Non-linear tri-band phosphor lamps with tube diameter >17 mm(e.g.T9): 15 mg
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps):15mg
3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL)for special purposes not exceeding (per lamp):
3(a)	Short length($\underline{<}$ 500 mm):3.5mg
3(b)	Medium length(>500 mm and$\underline{\leq}$1500 mm): 5mg
3(c)	Long length(>1500 mm): 13mg
4(a)	Mercury in other low pressure discharge lamps (per lamp): 15mg

4(b)	Mercury in High Pressure Sodium(vapour) lamps for general lighting purposes not exceeding (per burner)in lamps with improved colour rendering index Ra>60:
4(b)-I	P ≤155 W : 30 mg
4(b)-II	155 W < P ≤405 W : 40 mg
4(b)-III	P >405 W: 40 mg
4(c)	Mercury in other High Pressure Sodium(vapour)lamps for general lighting purposes not exceeding (per burner):
4(c)-I	P≤155 W:25mg
4(c)-II	155 W < P ≤ 405 W:30 mg
4(c)-III	P >405 W:40 mg
4(d)	Mercury in High Pressure Mercury (vapour) lamps (HPMV)
4(e)	Mercury in metal halide lamps (MH)
4(f)	Mercury in other discharge lamps for special purposes not specifically mentioned in this Schedule
5(a)	Lead in glass of cathode ray tubes
5(b)	Lead in glass of fluorescent tubes not exceeding 0.2% by weight
6(a)	Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight
6(b)	Lead as an alloying element in aluminium containing up to 0.4% lead by weight
6(c)	Copper alloy containing up to 4% lead by weight
7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead)
7(b)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
7(c)-III	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs
8(b)	Cadmium and its compounds in electrical contracts
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0.75% by weight in the cooling solution

9(b)	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) application.
11(a)	Lead used in C-press compliant pin connector systems
11(b)	Lead used in other than C-press compliant pin connector systems
12	Lead as a coating material for the thermal conduction module C- ring
13(a)	Lead in white glasses used for optical applications
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards.
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages.
16	Lead in linear incandescent lamps with silicate coated tubes
17	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications.
18(a)	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as specialty lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ($(Sr, Ba)_2Mg\ Si_2O_7$:Pb)
18(b)	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($Ba\ Si_2O_5$:Pb)
19	Lead with PbBiSn-Hg and PblnSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)
21	Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm and less
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
25	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring.
26	Lead oxide in the glass envelope of black light blue lamps
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers
29	Lead bound in crystal glass

30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB(A) and more
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
33	Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers
34	Lead in cermet-based trimmer potentiometer elements
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide
39	Cadmium in colour converting II-VI LEDs (<10 µg Cd per mm^2 of light-emitting area) for use in solid state illumination or display systems.

SCHEDULE III

[See rules 5 (1) (a) and 13 (1) (ii)]

Targets for Extended Producer Responsibility - Authorisation

No.	Year	E-Waste Collection Target (Number/Weight)
(i)	During first two year of implementation of rules	30% of the quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(ii)	During third and fourth years of implementation of rules	40% of the quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(iii)	During Fifth and Sixth years of implementation of rules	50% of the quantity of waste generation as indicated in Extended Producer Responsibility Plan.
(iv)	Seventh year onward of implementation of rules	70% of the quantity of waste generation as indicated in Extended Producer Responsibility Plan.

SCHEDULE IV

[See rule (17)]

LIST OF AUTHORITIES AND CORREPONDING DUTIES

Sr. No	AUTHORITY	CORRESPONDING DUTIES
1.	Central Pollution Control Board, Delhi	(i) Grant and Renewal of Extended Producer Responsibility - Authorisation and monitoring of its compliance. (ii) Maintain information on Extended Producer Responsibility - Authorisation on its web site. (iii) Set and revise targets for collection of e-waste from time to time. (iv) Coordination with State Pollution Control Boards (v) Preparation of Guidelines for Environmentally Sound Management of e-waste. (vi) Conduct random check for ascertaining compliance of the e-waste rules and identification of such importers or producers who have not applied for Extended Producer Responsibility authorisation or are not complying with RoHS provision. Wherever necessary, Central Pollution Control Board will seek the help of customs department or any other agency of the Government of India. (vii) Conduct random inspection of dismantler or recycler or refurbisher. (viii) Documentation, compilation of data on e-waste and uploading on websites of Central Pollution Control Board (ix) Actions against violation of these rules. (x) Conducting training programmes. (xi) Submit Annual Report to the Ministry. (xii) Enforcement of provisions regarding reduction in use of hazardous substances in manufacture of electrical and electronic equipment. (xiii) Interaction with IT industry for reducing hazardous substances. (xiv) Set and revise targets for compliance to the reduction in use of hazardous substance in manufacture of electrical and electronic equipment from time to time. (xv) Any other function delegated by the Ministry under these rules from time to time.

2.	State Pollution Control Boards or Committees of Union territories	(i) Inventorisation of e-waste. (ii) Grant and renewal of authorisation to manufacturers, dismantlers, recyclers and refurbishers. (iii) Monitoring and compliance of Extended Producer Responsibility - Authorisation as directed by Central Pollution Control Board and that of dismantlers, recyclers and refurbishers authorisation. (iv) Conduct random inspection of dismantler or recycler or refurbisher. (v) Maintain online information regarding authorisation granted to manufacturers, dismantlers, recyclers and refurbishers.

Sr. No	AUTHORITY	CORRESPONDING DUTIES
		(vi) Implementation of programmes to encourage environmentally sound recycling. (vii) Action against violations of these rules. (viii) Any other function delegated by the Ministry under these rules.
3.	Urban Local Bodies (Municipal Committee or Council or Corporation)	(i) To ensure that e-waste if found to be mixed with Municipal Solid Waste is properly segregated, collected and is channelised to authorised dismantler or recycler. (ii) To ensure that e-waste pertaining to orphan products is collected and channelised to authorised dismantler or recycler.
4.	Port authority under Indian Ports Act, 1908 (15 of 1908) and Customs Authority under the Customs Act, 1962 (52 of 1962)	(i) Verify the Extended Producer Responsibility - Authorisation. (ii) Inform Central Pollution Control Board of any illegal traffic for necessary action. (iii) Take action against importer for violations under the Indian Ports Act, 1908/Customs Act, 1962.

****

FORM-1

[See Rules 5(1) (g), 13(1) (i), 13(1) (vi)]

Applicable to producers seeking Extended Producer Responsibility - Authorisation

The application form should contain the following information:

1.	Name and full address along with telephone numbers, e-mail and other contact details of Producer (It should be the place from where sale in entire country is being managed)	:	
2.	Name of the Authorised Person and full address with e-mail, telephone and fax number	:	
3.	Name, address and contact details of Producer Responsibility Organisation, if any with full address, e-mail, telephone and fax number, if engaged for implementing the Extended Producer Responsibility	:	
4.	Details of electrical and electronic equipment placed on market year-wise during previous 10 years in the form of Table 1 as given below:	:	

Table 1: Details of Electrical and Electronic Equipment placed on the market in previous years - Code wise

Sr. No.	**Electrical and Electronic Equipment Item**	**Electrical and Electronic Equipment Code**	**Quantity, number and weight placed on market (year-wise)**									
A	**Information technology and telecommunication equipment:**											
1	Centralised data processing: Mainframes, Minicomputers	ITEW1										
2	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2										

3	Personal Computing: Laptop Computers(Central Processing Unit with input and	ITEW3										
	output devices)											
4	Personal Computing: Notebook Computers	ITEW4										
5	Personal Computing: Notepad Computers	ITEW5										
6	Printers including cartridges	ITEW6										
7	Copying equipment	ITEW7										
8	Electrical and electronic typewriters	ITEW8										
9	User terminals and systems	ITEW9										
10	Facsimile	ITEW10										
11	Telex	ITEW11										
12	Telephones	ITEW12										
13	Pay telephones	ITEW13										
14	Cordless telephones	ITEW14										
15	Cellular telephones	ITEW15										
16	Answering systems	ITEW16										
B	**Consumer electrical and electronics:**											
17	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1										
18	Refrigerator	CEEW2										
19	Washing Machine	CEEW3										
20	Air-conditioners excluding centralised air conditioning plants	CEEW4										
21	Fluorescent and other Mercury containing lamps	CEEW5										

5. Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year in the form of Table 2 including those being generated from their service centres, as given below:

Table 2: Estimated generation of Electrical and Electronic Equipment waste item-wise and estimated collection target for the forthcoming year

Sr. No.	Item	Estimated waste electrical and electronic equipment generation Number and weight	Targeted collection Number and weight

6. Extended Producer Responsibility Plans:

(a) Please provide details of your overall scheme to fulfil Extended Producer Responsibility obligations including targets. This should comprise of general scheme of collection of used/waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier such as through dealers and collection centres, Producer Responsibility Organisation, through buy-back arrangement, exchange scheme, Deposit Refund Scheme, etc. whether directly or through any authorised agency and channelising the items so collected to authorised recyclers.

(b) Provide the list with addresses along with agreement copies with dealers, collection centres, recyclers, Treatment, Storage and Disposal Facility, etc. under your scheme.

7. Estimated budget for Extended Producer Responsibility and allied initiatives to create consumer awareness.

8. Details of proposed awareness programmes.

9. Details for Reduction of Hazardous Substances compliance (to be filled if applicable):

(a) Whether the Electrical and Electronic Equipment placed on market complies with the rule 16 (1) limits with respect to lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominateddiphenyl ethers;

(b)Provide the technical documents (Supplier declarations, Materials declarations/Analytical reports) as evidence that the Reduction of Hazardous Substances (RoHS) provisions are complied by the product based on standard EN 50581 of EU;

(c) Documents required:

i. Extended Producer Responsibility plan;
ii. Copy of the permission from the relevant Ministry/Department for selling their product;
iii. Copies of agreement with dealers, collection centre, recyclers, Treatment, Storage and Disposal Facility, etc.;
iv. Copy of Directorate General of Foreign Trade license/permission as applicable;
v. Self-declaration regarding Reduction of Hazardous Substances provision;
vi. Any other document as required.

(Authorised signature)

Place: _____

Date: _____

FORM 1(a)

[See rules 4(2), 8 (2), 13(2) (ii), 13(2) (vi) and 13(4) (i)]

APPLICATION FOR OBTAINING AUTHORISATION FOR GENERATION OR STORAGE OR TREATMENT OR DISPOSAL OF E-WASTE BY MANUFACTURER OR REFURBISHER*

From: .....
.....

To

The Member Secretary,
..... Pollution Control Board or… ..... Pollution Control Committee
.....
.....

Sir,

I / We hereby apply for authorisation/renewal of authorisation under rule 13(2) (i) to 13(2) (viii) and/or 13 (4) (i) of the E-Waste (Management) Rules, 2016 for collection/storage/ transportation/ treatment/ refurbishing/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

1. Name and full address:
2. Contact Person with designation and contact details such as telephone Nos, Fax. No. and E-mail:
3. Authorisation required for (Please tick mark appropriate activity/ies*)
   - (i) Generation during manufacturing or refurbishing* ☐
   - (ii) Treatment, if any ☐
   - (iii) Collection, Transportation, Storage ☐
   - (iv) Refurbishing ☐

4. E-waste details:
   - (a) Total quantity e-waste generated in MT/A
   - (b) Quantity refurbished (applicable to refurbisher)
   - (c) Quantity sent for recycling
   - (d) Quantity sent for disposal

5. Details of Facilities for storage/handling/treatment/refurbishing:

6. In case of renewal of authorisation previous authorisation no. and date and details of annual returns:

Place :_____ Signature _____

(Name_____)

Date : _____

Designation: _____

Note:-

(1) * The authorisation for e-waste may be obtained along with authorisation for hazardous waste under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008, if applicable.

(2) Wherever necessary, use additional sheets to give requisite and necessary details.

FORM 1 (aa)

[See rules 5 (6) and 13(1)(ii)]

FORMAT OF EXTENDED PRODUCER RESPONSIBILITY - AUTHORISATION

[Extended Producer Responsibility Authorisation for Producer of the Electrical & Electronic Equipment]

Ref: Your application for Grant of Extended Producer Responsibility - Authorisation for following Electrical & Electronic Equipment under E-Waste (Management) Rules, 2016

1. Number of Authorisation:

   Date:

2. **M/s. ----------** is hereby granted Extended Producer Responsibility - Authorisation based on:
   (a) overall Extended Producer Responsibility plan
   (b) proposed target for collection of e-waste

3. The Authorisation shall be valid for a period of_____years from date of issue with following conditions:

   (i) you shall strictly follow the approved Extended Producer Responsibility plan, a copy of which is enclosed herewith;

   (ii) you shall ensure that collection mechanism or centre are set up or designated as per the details given in the Extended Producer Responsibility plan. Information on collection mechanism/centre including the state-wise setup should be provided;

   (iii) you shall ensure that all the collected e-waste is channelised to authorised dismantler or recycler designated as per the details. Information on authorised dismantler or recycler designated state-wise should be provided;

   (iv) you shall maintain records, in Form-2 of these Rules, of e-waste and make such records available for scrutiny by Central Pollution Control Board;

   (v) you shall file annual returns in Form-3 to the Central Pollution Control Board on or before 30th day of June following the financial year to which that returns relates;

   (vi) General Terms & Conditions of the Authorisation:

a. The authorisation shall comply with provisions of the Environment (Protection) Act, 1986 and the Rules made there under;

b. The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the Central Pollution Control Board;

c. Any change in the approved Extended Producer Responsibility plan should be informed to Central Pollution Control Board on which decision shall be communicated by Central Pollution Control Board within sixty days;

d. It is the duty of the authorised person to take prior permission of the concerned State Pollution Control Boards and Central Pollution Control Board to close down the facility;

e. An application for the renewal of authorisation shall be made as laid down in sub-rule (vi) of rule of 13(1) the E-Waste (Management) Rules, 2016;

f. The Board reserves right to cancel/amend/revoke the authorisation at any time as per the Policy of the Board or Government.

Authorized signatory (with designation)

To,

Concerned Producer
Copy to:

1. Member Secretary, Concerned State.
2. In-charge, concerned Zonal Office, Central Pollution Control Board.

FORM 1(bb)

[See rules 4(2), 8(2)(a), 13(2) (iii) and 13(4)(ii)]

FORMAT FOR GRANTING AUTHORISATION FOR GENERATION OR STORAGE OR TREATMENT OR REFURBISHING OR DISPOSAL OF E-WASTE BY MANUFACTURER OR REFURBISHER

Ref: **Your application for Grant of Authorisation**

1. (a) Authorisation no. ..... and (b) date of issue ……

2. ……..……of……is hereby granted an authorisation for generation, storage, treatment, disposal of e-waste on the premises situated at… ..... for the following:
   a. quantity of e-waste;
   b. nature of e-waste.

3. The authorisation shall be valid for a period from …… to ……

4. The e-waste mentioned above shall be treated/ disposed off in a manner.....at .....

5. The authorisation is subject to the conditions stated below and such conditions as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.

Signature ----------
Designation ---------- Date: ----------

Terms and conditions of authorisation

1. The authorisation shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made thereunder.
2. The authorisation or its renewal shall be produced for inspection at the request of an officer authorized by the concerned State Pollution Control Board.
3. Any unauthorised change in personnel, equipment as working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorisation.
4. It is the duty of the authorised person to take prior permission of the concerned State Pollution Control Board to close down the operations.
5. An application for the renewal of an authorisation shall be made as laid down in sub-rule (vi) of rule 13(2).

FORM-2

[See rules 4(4), 5(4), 6(5), 8(7), 9(2), 10(7), 11(8), 13 (1) (xi), 13(2)(v), 13(3)(vii) and 13 (4)(v)]

FORM FOR MAINTAINING RECORDS OF E-WASTE HANDLED OR GENERATED

Generated Quantity in Metric Tonnes (MT) per year

1.	Name & Address: Producer or Manufacturer or Refurbisher or Dismantler or Recycler or Bulk Consumer*		
2.	Date of Issue of Extended Producer Responsibility Authorisation*/ Authorisation*		
3.	Validity of Extended Producer Responsibility Authorisation*/ Authorisation*		
4.	Types & Quantity of e-waste handled or generated**	Category	Quantity
		Item Description	
5.	Types & Quantity of e-waste stored	Category	Quantity
		Item Description	
6.	Types & Quantity of e-waste sent to collection centre authorised by producer/ dismantler/recycler / refurbisher or authorised dismantler/recycler or refurbisher**	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 e-waste sent to recyclers by dismantlers	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		
12.	Types & Quantity of other waste sent to respective recyclers by dismantlers/recyclers of e-waste	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		
13.	Types & Quantity of e-waste treated & disposed	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		

Note:-

(1) * Strike off whichever is not applicable

(2) Provide any other information as stipulated in the conditions to the authoriser

(3) ** For producers this information has to be provided state-wise

FORM-3

[See rules 4(5), 5(5), 8(6), 9(4), 10(8), 11(9), 13 (1) (xi), 13(2)(v), 13(3)(vii) and 13(4)(v)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted by producer or manufacturer or refurbisher or dismantler or recycler by 30th day of June following the financial year to which that return relates].

Quantity in Metric Tonnes (MT) and numbers

1	Name and address of the producer or manufacturer or refurbisher or dismantler or recycler			
2	Name of the authorised person and complete address with telephone and fax numbers and e-mail address			
3	Total quantity of e-waste collected or channelised to recyclers or dismantlers for processing during the year for each category of electrical and electronic equipment listed in the Schedule I (Attach list) by PRODUCERS			
	Details of the above	TYPE	QUANTITY	No.
3(A)*	BULK CONSUMERS: Quantity of e-waste			
3(B)*	REFURBISHERS: Quantity of e-waste:			
3(C)*	DISMANTLERS: i Quantity of e-waste processed (Code wise); ii. Details of materials or components recovered and sold; iii. Quantity of e-waste sent to recycler; iv. Residual quantity of e-waste sent to Treatment, Storage and Disposal Facility.			
3(D)*	RECYCLERS: i. Quantity of e-waste processed (Code wise); ii. Details of materials recovered and sold in the market; iii. Details of residue sent to Treatment, Storage and Disposal Facility.			
4	Name and full address of the destination with respect to 3(A)-3(D) above			
5	Type and quantity of materials segregated or recovered from e-waste of different codes as applicable to 3(A)-3(D)	Type	Quantity	

✔Enclose the list of recyclers to whom e-waste have been sent for recycling.

Place_____

Date_____

Signature of the authorised person

Note:-

(1) * Strike off whichever is not applicable
(2) Provide any other information as stipulated in the conditions to the authoriser
(3) In case filing on behalf of multiple regional offices, Bulk Consumers and Producers need to add extra rows to 1 & 3(A) with respect to each office.

FORM-4

[See rules 13(3)(i) and 13(3)(vi)]

APPLICATION FORM FOR AUTHORISATION OF FACILITIES POSSESSING ENVIRONMENTALLY SOUND MANAGEMENT PRACTICE FOR DISMANTLING OR RECYCLING OF 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 and Control of Pollution) Act, 1974; Valid up to _____ b. Air (Prevention and Control of Pollution) Act, 1981; Valid up to_____	
6.	Validity of current authorisation if any	e-waste (Management & Handling) Rules, 2011; Valid up to _____	
7.	Dismantling or Recycling Process	Please attach complete details	
8.	Installed capacity in MT/year	Products	Installed capacity (MTA)

9.	E-waste processed during last three years	Year	Product	Quantity
10.	Waste Management:			
	a. Waste generation in processing e-waste	Please provide details material wise		
	b. Provide details of disposal of residue.	Please provide details		
	c. Name of Treatment Storage and Disposal Facility utilized for			
11.	Details of e-waste proposed to be procured from re-processing	Please provide details		
12.	Occupational safety and health aspects	Please provide details		
13.	Details of Facilities for dismantling both manual as well as mechanised:			
14.	Copy of agreement with Collection Centre			
15.	Copy agreement with Producer			
16.	Details of storage for dismantled e-waste			
17.	Copy of agreement with Recycler			
18.	Details of Facilities for Recycling			
19.	Copy of agreement with Collection Centre			
20.	Copy agreement with Producer			
21.	Details of storage for raw materials and recovered materials			

II. In case of renewal of **authorisation, previous registration or authorisation no. and date**

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

Signature

Place:_____ Name:_____

Date:_____ Designation:_____

Form-5

[See rule 18 (1)]

FORM FOR ANNUAL REPORT TO BE SUBMITTED BY THE STATE POLLUTION CONTROL BOARD 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.	Number of authorised manufacturer, refurbisher, collection centre, dismantler and recycler for management of e-waste in the State or Union territory under these rules	:	
2.	Categories of waste collected along with their quantities on a monthly average basis:	:	Please attach as Annexure-I
3.	A Summary Statement code-wise of e-waste Collected	:	Please attach as Annexure-II
4.	Details of material recovered from recycling of e-waste	:	
5.	Quantity of CFL received at Treatment, Storage and Disposal Facility	:	
6.	The above report is for the period from ……to .....……		

Place: _____

Date: _____

Chairman or the Member Secretary
State Pollution Control Board

Form-6

[See rule 19]

E-WASTE MANIFEST

1.	Sender's name and mailing address (including Phone No.) :	
2.	Sender's authorisation No, if applicable. :	
3.	Manifest Document No. :	
4.	Transporter's name and address : (including Phone No.)	
5.	Type of vehicle :	(Truck or Tanker or Special Vehicle)
6.	Transporter/s registration No. :	
7.	Vehicle registration No. :	
8.	Receiver's name & address :	
9.	Receiver's authorisation No, if applicable. :	
10.	Description of E-Waste (Item, Weight/ Numbers) :	
11.	Name and stamp of Sender* (Manufacturer or Producer or Bulk Consumer or Collection Centre or Refurbisher or Dismantler): Signature: Month Day Year	
12.	Transporter acknowledgement of receipt of E-Wastes	
	Name and stamp: Signature: Month Day Year	
13.	Receiver* (Collection Centre or Refurbisher or Dismantler or Recycler) certification of receipt of E-waste	
	Name and stamp: Signature: Month Day Year	

* As applicable

Note:-

Copy number with colour code (1)	Purpose (2)
Copy 1 (Yellow)	To be retained by the sender after taking signature on it from the transporter and other three copies will be carried by transporter.

Copy 2 (Pink)	To be retained by the receiver after signature of the transporter.
Copy 3 (Orange)	To be retained by the transporter after taking signature of the receiver.
Copy 4 (Green)	To be returned by the receiver with his/her signature to the sender

FORM 7

[See rule 22]

APPLICATION FOR FILING APPEAL

AGAINST THE ORDER PASSED BY CENTRAL POLLUTION CONTROL BOARD/STATE POLLUTION CONTROL BOARD

1. Name and address of the person making the appeal :
2. Number, date of order and address of the authority : (certified copy of the to which passed the order, against which appeal is order be attached)
3. Ground on which the appeal is being made :
4. Relief sought for :
5. List of enclosures other than the order referred in point 2 against which the appeal is being filed. :

Signature…….

Name and address……

Date.....

Place.....

Bishwanath Sinha Joint Secretary to Government of India
(F No. 12-6/2013-HSMD)

****

Annexure-III

Implementation Guidelines for E-Waste (Management) Rules, 2016

Central Pollution Control Board, Delhi

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1.0 Introduction

E- Waste (Management & Handling) Rules, 2011 were notified in 2011 and had come into force since 1st May, 2012. In order to ensure effective implementation of E-Waste Rules and to clearly delineated the role of producers in EPR, MoEF & CC, Government of India in supersession of E-Waste (Management and Handling) Rules, 2011 has notified the E-Waste (Management) Rules, 2016 vide G.S.R. 338(E) dated 23.03.2016 which will be effective from 01-10-2016. These rules are applicable to every producer, consumer or bulk consumer, collection centre, dismantler and recycler of e-waste involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components specified in schedule – I of these Rules.

Two categories of electrical and electronic equipment namely (i) IT and Telecommunication Equipment and (ii.) Consumer Electricals and Electronics such as TVs, Washing Machines, Refrigerators Air Conditioners including fluorescent and other mercury containing lamps are covered under these Rules. The main feature, of these rules, is Extended Producer Responsibility (EPR).

Target based approach for implementation of EPR has been adopted in the **E-Waste (Management) Rules, 2016,** which stipulate phase wise collection target to producers for the collection of e-waste, either in number or weight, which shall be 30% of the estimated quantity of waste generation during first two year of implementation of rules followed by 40% during third and fourth years, 50% during fifth and sixth years and 70% during seventh year onwards.

The E-Waste (Management) Rules, 2016 mandate CPCB to prepare guidelines on implementation of E-Waste Rules, which includes specific guidelines for extended producer responsibility, channelisation, collection centres, storage, transportation, environmentally sound dismantling and recycling, refurbishment, and random sampling of EEE for testing of RoHS parameters. In this document all the above guidelines have been compiled except guidelines for random sampling of EEE for testing of RoHS parameters. These guidelines are given in separate sections of this document.

Guidelines for Implementing Extended Producer Responsibility

Extended Producer Responsibility (EPR) is the responsibility of every producer of electrical and electronic equipment (EEE) for channelisation of e-waste to an authorised dismantler / recycler to ensure environmentally sound management of such waste. EPR authorisation is mandatory and has to be obtained by all the producers including importers, e-retailers/on-line sellers/e-bay etc. of EEE covered in E-Waste (Management) Rules, 2016. A producer can implement its EPR either through take-back system or by setting up collection centres or both for channelisation of e-waste/end of life products to authorised dismantlers/recyclers. The producers are required to have arrangements with authorised dismantlers/recyclers either individually or collectively or through a Producer Responsibility Organisation (PRO) or E- Waste Exchange system as spelt in their EPR Plan which is approved/authorised by Central Pollution Control Board (CPCB). Selling or placing of EEE in the market by any producer without EPR Authorisation shall be considered as violation of the Rules and causing damage to the environment, which shall attract provisions under E (P) Act, 1986.

Extended Producer Responsibility Plan (EPR- Plan)

EPR Plan is an implementation plan of the producer where the producer gives its overall scheme to fulfil its Extended Producer Responsibility for achieving targets and details out the mechanism for collection and channelisation of e-waste generated by the producer.

The EPR plan requires estimating the quantity of E-waste generated from their end-of-life products, outlining a scheme for collection and channelization of their end-of-life products or products with same EEE code to authorised dismantlers/recyclers,

estimated budget for implementing EPR, outline the scheme of creating awareness, declaration on ROHS compliance and submission of documents in this regard. Every producer should make an application seeking EPR authorisation in Form-1 of the E-Waste (M) Rules, 2016 addressed to the Member Secretary, Central Pollution Control Board. Form-1 should contain the relevant information pertaining to collection and channelization of their end-of-life products as detailed in sections 2.1.1 to 2.1.7. The Producers has liberty to revise their EPR Plan from time to time with information to CPCB. In such cases the EPR authorisation need amendments.

Estimation of E-Waste Generation - E-waste generated by producer for a specific EEE category code is to be estimated on the basis of quantity (number or weight) of EEE placed in the market in the previous years and taking into consideration the average life of the equipment. Such estimate should be carried out using the following method;

The generation of e-waste from end of life products:

E-waste generation (weight or number) in the financial year 'x – y' = Sales in the financial year '(x-z) - (y-z)'

where, 'x – y' = financial year in which generation is estimated, and z= average life span of EEE (Examples are given at **Annexure - I**)

Average life of the EEE to be used in the above formula is given below:

Sr. No.	**Categories of electrical and electronic equipment**	**EEE Code**	**Average Life**
i.	**Information technology and telecommunication equipment**		
	Centralized data processing:	ITEW1	
	Mainframe		10 Years
	Minicomputer		5 Years
	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2	6 Years

	Personal Computing: Laptop Computers(Central Processing Unit with input and output devices)	ITEW3	5 Years
	Personal Computing: Notebook Computers	ITEW4	5 Years
	Personal Computing: Notepad Computers	ITEW5	5 Years
	Printers including cartridges	ITEW6	10 Years
	Copying equipment	ITEW7	8 Years
	Electrical and electronic typewriters	ITEW8	5 Years
	User terminals and systems	ITEW9	6 Years
	Facsimile	ITEW10	10 Years
	Telex	ITEW11	5 Years
	Telephones	ITEW12	9 Years
	Pay telephones	ITEW13	9 Years
	Cordless telephones	ITEW14	9 Years
	Cellular telephones	ITEW15	
	Feature phones		7 Years
	Smart phones		5 Years
	Answering systems	ITEW16	5 Years
ii.	**Consumer electrical and electronics:**		

Sr. No.	**Categories of electrical and electronic equipment**	**EEE Code**	**Average Life**
	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1	9 Years
	Refrigerator	CEEW2	10 Years
	Washing Machine	CCEW3	9 Years
	Air-conditioners excluding centralized air conditioning plants	CCEW4	10 Years
	Fluorescent and other Mercury containing lamps	CEEW5	2 Years

Estimation of Target for Collection – the target for collection of E-Waste shall be based on estimated generation calculated for each EEE code for a specific financial year as specified above. E-Waste collection target for the financial year 2016 – 2017 would be 15% of the estimated E-waste generation, and for the year 2017 – 2018, the collection target would be 30%. These targets would increase to 40 % for next 2 financial years between 2018 – 2020, 50% for the financial years between 2020 - 2022 and 70% of the estimated E-waste generation for the financial years 2022 – 2023 onwards. Here it may be observed that collection targets would be applicable depending on life of the

product given in above table and accordingly, if a producer enters the business in the year 2016 - 2017 for item code ITEW7(copying equipment), the collection targets for which would be applicable from the year 2021-22 at 50% collection target.

Details of Extended Producer Responsibility Plan – Producers should submit their own EPR plans appended to Form-1 for seeking EPR authorization. Producers may submit multiple options and schemes for channelization of E-Waste and such scheme should be described with a brief write-up along with a schematic flow chart/diagram of E-waste movement. The options and schemes for E-Waste channelization may comprise the following;

- Details of scheme/incentive for returning of e-waste by consumers /bulk consumers whether through dealers or buy-back arrangements or take-back systems or exchange scheme for channelization of e-waste.
- If producer is opting to manage its EPR responsibility through PRO, then details of PRO's organisational structure and system of collection and channelisation to the authorised dismantlers/recyclers of e-waste.

- If e-waste exchange is part of channelisation then the details thereof.
- If producer is opting for 'deposit refund scheme' (DRS) or exchange scheme for collection and channelisation of e-waste, then the details of mode of refund of the deposited amount taken from the consumer or bulk consumer at the time of sale has to be specified along with interest that becomes due at the prevalent rate for the period of the deposit at the time of take-back of the end-of life products.
- Producers of item code: CEEW5 (fluorescent and other

mercury containing lamp) may provide list of waste deposition centre or collection points financed by them as per their obligation under rule 17 (1) of the Solid Waste Management Rules 2016 for channelizing such wastes to recyclers or TSDFs.

Collection and Storage plan - Information pertaining to collection and storage should be appended to Form-1. It should be ensured that collection and storage of E-waste is managed as per the guidelines for 'collection and storage of e-waste' as given in section 3.0 of this document.

Channelization Plan - Form-1 should provide information pertaining to channelization. The following points should be considered in planning a system for E-Waste channelisation;

- make assessment of potential collection of e-waste, area or region wise.
- take help of any professional agency like Producer Responsibility Organisation (PRO) and e-waste exchange.
- identify authorised dismantlers/recyclers for channelisation of quantum of e-waste assessed above. Assess the capacity and capability of each identified authorised dismantlers/recyclers to ensure environmentally sound management of e-waste channelised to them.

Collection Centres – Producers shall specify details of their own collections centres or the collection centres with which they have agreement. Following details on collection centres should be provided in Form-1 if the collection centres are part of their channelisation;

- details of collection centres such as address and name(s) of the entity (producer, group of producers, refurbisher, recyclers or dismantlers) who are operating the collection

centres in tabular form.

- The number of collection centres should be proportionate and justifiable with the estimated generation for channelization of e-waste. These collections centres or collection points should have facilities as specified in section 4.0 of this document.

Dismantlers & Recyclers – Details such as name, location, processing capacity and contact details of the authorised dismantling /recycling facilities, which are part of channelisation of E-waste of the producer should be provided in a separate table to Form-1. The details provided above should be commensurate and justifiable with the quantum of e-waste estimated as per section 2.1.2 of this document.

Treatment, Storage, Disposal Facilities (TSDFs) – In case there are no recyclers available for recycling of end-of-life EEE item code: CEEW5 (fluorescent and other mercury containing lamps), then the producers should provide list of Treatment Storage and Disposal Facilities with whom they have agreement.

Documents required with Form-1

Every producer of EEE listed in Schedule-I has to apply in Form-1 address to the Member Secretary, CPCB for seeking EPR Authorisation within a period of ninety (90) days starting from 01/10/2016. In case of renewal of EPR Authorisation, the application to CPCB has to be made before one hundred and twenty (120) days of its expiry. The following documents are required to be submitted along with Form-1:

- Documents related to EPR plan as envisaged in sections 2.1.
- Details of proposed awareness programmes and allied initiatives.

- Estimated budget earmarked for Extended Producer Responsibility (EPR)
- Copies of agreement document with dealers, collection centres, dismantlers, recyclers, treatment, storage and disposal facilities (TSDFs) etc.
- Self-declaration for compliance of RoHS as per the format given at Annexure – II.
- The technical documents (supplier declaration- description of product, document for materials, parts, and/or sub-assemblies and analytical test result) as an evidence that the reduction of hazardous substance (RoHS) provisions are complied by the product based on standard EN 50581 of EU as at Annexure - III

- Copy of the permissions/licences from the relevant ministry/department for marketing various products or for doing the business as given below:
    i. TIN details
    ii. PAN details
    iii. Incorporation certificate
    iv. Copy IEC in case of importers
- Copy of authorisation issued by the SPCBs/PCCs earlier under E-Waste (Management & Handling) Rules, 2011 in case of those producers who are operating in the country prior to 01-10-2016.

Guidelines for Collection and Storage of E-Waste

- After assessing their requirement of collection of e-waste, producers may device a collection mechanism which may include take-back through dealers, collection centres or directly through authorised dismantlers/recyclers.
- For collection of e-waste producer may take help of any professional agency like Producer Responsibility Organisation (PRO)/e-waste exchange. Producer may manage a system

directly for collection of e-waste by involving relevant stakeholders such as consumer, bulk consumer, informal sector, resident associations, retailers and dealers, etc.

- Producers may also have an arrangement of collection of e-waste from individual consumers and bulk consumers as well.
- The producers may publicize their collection system which may include details of their collection points, bins and collection vans linked to collection centres, take-back system, deposit refund scheme, e-waste exchange, retailers/dealers and PRO etc. for making collection system effective and workable.
- If take - back system is being provided, then it should be accessible to any citizen located anywhere in the country and may be provided through retailers/dealers or through service centres.
- The producers may provide consumer/ bulk consumer following details of take-back system:
    - (i) Link of their web site where information pertaining to take-back system is available
    - (ii) Toll free number to be available during working hours (10 A.M. to 6 P.M.) for consumers / bulk consumers.
    - (iii) Phone number/mobile numbers of grievance redressal in case, toll free number is not working
    - (iv) Details of their dealers, retailers, collection points/bins/pick up vans linked to collection centres for depositing of e-waste by the consumer/bulk consumers if they are part of the take-back system
    - (v) Details of any incentive scheme for consumers / bulk consumers for returning of e- waste
    - (vi) Details of authorised dismantlers/recyclers who can take-back e-waste on behalf of the producer if dismantlers/recyclers are part of take-back system
- Producers may maintain data base of consumers while selling EEE so that consumers/ bulk consumers can be approached for collection of e-waste / end of life products.

- Every Producer, collection centre, dealer, dismantler, recycler and refurbisher may store the e-waste for a period not exceeding one hundred and eighty (180) days and shall maintain a record of collection, sale, transfer and storage of wastes and make these records available for inspection. The period of storage of one hundred and eighty (180) days may be extended by the concerned SPCBs/PCCs up to three hundred and sixty-five (365) days in case the e- waste needs to be specifically stored for research development of a process for its recycling or reuse.
- Storage of end of life products may be done in a manner which does not lead to breakage of these products and safe to workers handling such products.
- During storage of e-waste care may be taken:
  - (i) To avoid damage to refrigerators and air-conditioner so as to prevent release of refrigerant gases such as CFC, HFS, HCFC etc. and to prevent spillage of oils (mineral or synthetic oil) and other emissions.
  - (ii) To avoid damage to Cathode Ray Tube
  - (iii) To avoid damage to fluorescent and other mercury containing lamps
  - (iv) To avoid damage to equipment containing asbestos or ceramic fibres to avoid release of asbestos or ceramic fibres in the environment.
- After collection of fluorescent and other mercury containing lamps, it should be sent only to a recycler or to a TSDF in case no recycler is available.
- Loading, transportation, unloading and storage of E-Waste / end of life products should be carried out in such a way that its end use such as re-use after refurbishing or recycling or recovery is unaffected.
- The storage area should have fire protection system in place.

Guidelines for Collection Centre

- Collection centre or collection points are part of E-waste channelisation, and can be established by producers, refurbishers, dismantlers and recyclers. Collection Centre may collect and store e-waste, on behalf of producer / dismantler / recycler /refurbisher and transfer the same to authorised dismantlers / recyclers.
- Only those collection centres may operate which are specified in EPR-Authorisation of the producers including the collection centres established by dismantlers / recyclers / refurbishers and having agreement with Producers.
- If the collection centres are operating on behalf of many producers, then all such producers should provide this information in their EPR application.
- Collection centres have to collect e-waste on behalf of producers including those arising from orphaned products. Collection centres established by producers can be managed by their PRO or dismantler and recycler having agreement with producers.
- The collection points/bins can be at designated places where e-waste can be collected from residential areas, office complexes, commercial complexes, retail outlets, customer care stores, educational and research institutions, resident welfare associations (RWAs). These collection points have to be part of producer's collection and channelisation plan.
- Mobile collection vans can be used for door to door collection of e-waste from institutions/ individuals/small enterprises and such vans shall be linked to collection centres, and if provided by producers, shall be part of their EPR Plan.
- Material from collection centres should be send only to the authorised dismantlers and Recyclers except in case of used Fluorescent and other mercury containing lamps, which can be sent to TSDF in case recyclers are not available.

Facilities at Collection Centres

- Collection Centre should have weighing equipment for weighing each delivery received by it and maintain a record in this regard.
- Loading, transportation and unloading, storage of end of life product should be carried out in such a way that there should not be any damage to health, environment and to the product itself particularly care should be taken for Cathode Ray Tubes (CRT), LCD/LED/Plasma TV, Refrigerator, Air Conditioners and fluorescent and other mercury containing lamps so as to avoid breakage.

- Cathode Ray Tubes (CRT), LCD / LED / Plasma TV and fluorescent and other mercury containing lamps should be stored either in containers or stored in stable manner to avoid damage or breakage.
- The storage capacity of any collection centre should commensurate with volume of operations (weight and numbers) and category of E-waste. Space needed for storage of different category of e-waste is given below:

(i)	ITEW1 to ITEW6	- 4.0 m^3/tonne
(ii)	Monitors (CRT)	- 5.0 m^3/tonne
(iii)	ITEW7 to ITEW10	- 5.0 m^3/tonne
(iv)	ITEW11 to ITEW14	- 3.0 m^3/tonne
(v)	ITEW15	- 1.0 m^3/tonne
(vi)	ITEW16	- 3.0 m^3/tonne
(vii)	CEEW1	- 6.5 m^3/tonne
(viii)	CEEW2	- 10.0 m^3/tonne
(ix)	CEEW3	- 7.5 m^3/tonne
(x)	CEEW4	- 6.0 m^3/tonne
(xi)	CEEW5	- 1.0 m3/tonne

- Collection Centre should store e-waste product category wise.
- Collection Centre should maintain the records of E-Waste collected and account the same to respective producers.

- The collection centre where refrigerator and air conditioners are also stored should have adequate facilities for managing leakage of compressor oils, coolant/refrigerant gases such as CFCs/HCFCs and mercury from end of life fluorescent and other mercury containing lamp etc. Spills involving broken Fluorescent lamps, Oils spills should first be contained to prevent spread of the material to other areas. This may involve the use of dry sand, proprietary booms / absorbent pads, stabilizing chemicals etc. for subsequent transfer of hazardous waste to TSDFs.
- Covered shed/spaces have to be used for storage of E-Waste.
- Collection Centre should necessarily have adequate fire-fighting arrangement, escape route, for emergency exit.

Guidelines for Transportation of E-Waste

- The sender of E-Waste, that may be a producer, manufacturer, recyclers, dismantler, bulk- consumer, refurbisher and collection centre should identify transporter or make arrangements for a transporting e-waste in such a manner that environmental consequences of hazards associated with its transport could be kept at minimum.
- Transport of E-Waste should be carried out as per the manifest system as per the provisions made in rule 19 of the E-Waste (M) Rules, 2016 and the transporter will be required to carry a document (three copies) as per form 6 of the rules provided by the sender. The responsibility of safe transportation of E-waste shall be with the sender of E-Waste.
- Fluorescent and other mercury containing lamps may be transported to TSDF in the cases where no recyclers of CFL are available
- The manufacturers and recyclers while transporting waste generated from manufacturing or recycling destined for final disposal to a treatment, storage and disposal facility will follow the provisions under Hazardous and Other Wastes

(Management and Transboundary Movement) Rules, 2016.

Guidelines for Environmentally Sound Dismantling of E-Waste

Dismantler

- Any person or organisation or registered society or a designated agency or a company or an association can engage in dismantling of e-waste into their components by obtaining authorisation from the respective SPCBs/PCCs. Dismantlers may set up their collection centre, details of which shall be entered in their authorisation. These collection centres shall not require separate authorisation.
- A dismantler shall be connected to either Producers or PRO or e-waste exchange or take- back system or authorised recycler.
- A dismantler has to obtain consent to establish from SPCBs/PCCs under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981
- A dismantler has to obtain consent to operate from SPCBs/PCCs under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981
- A dismantler has to obtain authorisation from SPCBs/PCCs under E Waste (Management) Rules, 2016, provided that any person authorised/registered under the provisions of the Hazardous Wastes (Management, Handling and Transboundary Movements) Rules, 2008, and the E-waste (Management & Handling) Rules, 2011 prior to the date of coming into force of these rules shall not be required to make an application for authorisation till the period of expiry of such authorisation/registration.
- A dismantler should have weigh bridge and other appropriate weighing equipment for weighing each delivery received by it and maintain a record in this regard.
- The unloading of e-waste/end of life products should be carried

out in such a way that there should not be any damage to health, environment and to the product itself. Unloading of Cathode Ray Tubes (CRT), LCD / LED / Plasma TV, refrigerator, air conditioners and fluorescent and other mercury containing lamps should be carried out under supervision in such a way to avoid breakage.

- A dismantler should have facilities for destroying or permanently deleting data stored in the memory of end of life products (Hard Disk, Telephones, Mobile phones) either through hammering or through data eraser.

Dismantling Process

Dismantling operation is essentially manual operation for segregating various components/ parts and sending them to respective users/ recyclers.Directly usable components can be sent only to an authorised refurbisher. The other parts can be sent to recyclers having valid CTO / authorised e- waste recyclers depending upon the nature of the part. For example, steel or aluminium part which contains no hazardous constituents can be sent to respective recyclers. Other parts which may contain hazardous constituents have to be sent to authorised e-waste recyclers.

- Dismantlers may perform the following operations
  - (i) De-dusting
  - (ii) Manual dismantling

- Dismantling operation shall comprise of physical separation and segregation after opening the electrical and electronic equipment into the component by manual operations.
- Dismantler may use screwdrivers, wrenches, pliers, wire cutters, tongs and hammers etc. for dismantling. The dismantled components should be sent to authorised e-waste recyclers or recyclers having valid consent to operate (CTO).
- Manual dismantling operations should be carried out over the

dismantling table with space de-dusting system so as to maintain desirable work zone air quality as per the factories Act as amended from time to time. The de dusting system should consist of suction hoods over dismantling table connected with a cyclone, bag filter and venting through a chimney of three-meter height above roof level.

- Collection boxes should be placed near dismantling table for keeping the dismantled components.
- The workers involved in dismantling operation should have appropriate equipment such as screwdrivers, wrenches, pliers, wire cutters, tongs and hammers etc. for dismantling the e-waste.
- During dismantling operations, the workers should use proper personal protective equipment such as goggles, masks, gloves, helmet and gumboot etc.
- The following dismantled items and components must be removed from end of life products and stored in a safe manner for transportation to recyclers:
    (i) Batteries
    (ii) Printed Circuit Boards (PCBs) of EEE
    (iii) Toner cartridges
    (iv) Plastic
    (v) External Electrical Cables
- Volume/Size reduction may be carried out after dismantling operations for the parts like steel/aluminium/plastic, for ease of transportation. Dismantled and segregated plastic from e-waste shall only be given to registered plastic recyclers having registration under Plastic Waste (Management) Rules, 2016.
- During the volume/size reduction of dismantled steel/aluminium/plastic parts, the dismantlers should have arrangement for dust and noise controls. These operations should be under acoustic enclosure for noise reduction.
- Dismantlers shall not carry out shredding / crushing / fine grinding/wet grinding/ enrichment operations and gravity/

magnetic/density/eddy current separation of printing circuit board or the components attached with the circuit board.

- Dismantlers shall not be permitted for dismantling of fluorescent and other mercury containing lamps, CRT / LCD / Plasma TV.
- Dismantlers shall not be permitted for chemical leaching or heating process or melting the material.
- In case of dismantling refrigerators and air conditioners, only skilled manpower having required tools and personal protective equipment (PPEs) must be deployed to manually separate compressors. Prior to dismantling the compressors, adequate facilities should be provided for collection of coolant/refrigerant gases and compressor oil.
- Dismantled circuit boards, capacitors, batteries, capacitors containing PCBs (Polychlorinated biphenyls) or PCTs (Polychlorinated terphenyls) etc. shall not be stored in open.
- Dismantlers should have adequate facilities for managing leakage of compressor oils, coolant/refrigerant gases such as CFCs/HCFCs and mercury from end of life fluorescent and other mercury containing lamp etc. Spills involving broken Fluorescent lamps, Oils spills should first be contained to prevent spread of the material to other areas. This may involve the use of dry sand, proprietary booms / absorbent pads, stabilizing chemicals etc. for subsequent transfer to hazardous waste TSDFs.
- The premise for dismantling operation should fulfil the following requirements:
    a) Water proof roofing and impermeable surfaces.
    b) Storage space for dissembled spare parts.
    c) Separate containers for storage of batteries, capacitors containing PCBs (Polychlorinated biphenyls) or PCTs (Polychlorinated terphenyls)

Space requirement for Dismantlers

A dismantler needs space for storage of electrical and electronic

equipment up to 180 days, for process of dismantling and volume reduction and space for storage of dismantled and segregated material and free space for movement and office/ administration and other utilities. It is estimated that a minimum of 300 square meter area for a dismantling capacity of 1T/day is required for storage of raw material, segregated material, dismantling operations and office/ administration & other utilities.

Guidelines for Environmentally Sound Recycling of E-Waste

Recycler

- As per these rules any person who is engaged in recycling and reprocessing of waste electrical and electronic equipment or assemblies or their component is a recycler. Recyclers may set up their collection centres, details of which shall be entered in their authorisation. These collection centres shall not require separate authorisation. Recyclers can obtain raw material such as waste electrical and electronic assemblies or components or used components from producers/PRO/e-waste exchange/dismantlers and consumers / bulk consumers.
- The Product of recyclers has to be sent or sold to users or other recyclers having valid CTO from SPCBs/PCCs. Any hazardous waste generated during the recycling processing will be sent to TSDF'
- A recycler should be part of producer's channelisation system.
- A recycler has to obtain consent to establish from SPCBs/PCCs under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981
- A recycler has to obtain consent to operate from SPCBs/PCCs under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981
- A recycler has to obtain authorisation from SPCBs/PCCs under E Waste (Management) Rules, 2016, provided that any person authorised/registered under the provisions of the Hazardous Wastes (Management, Handling and Transboundary Movements) Rules, 2008, and the E-waste (Management &

Handling) Rules, 2011 prior to the date of coming into force of these rules shall not be required to make an application for authorisation till the period of expiry of such authorisation/registration.

- A recycler should have weigh bridge and other appropriate weighing equipment for weighing each delivery received by it and maintain a record in this regard.
- The unloading of end of life product should be carried out in such a way that there should not be any damage to health, environment and to the product itself. Unloading of Cathode Ray Tubes (CRT), LCD/LED/Plasma TV, Refrigerator, Air Conditioners and fluorescent and other mercury containing lamps should be carried out under supervision in such a way to avoid breakage.
- A recycler should have facilities for destroying or permanently deleting data stored in the memory of end of life products (Hard Disk, Telephones, Mobile phones) either through shredding or grinding or through data eraser.

Recycling Process

- The functions of the recyclers include dismantling along with recovery operation. There shall be no restriction on degree of operations that can be permitted for recyclers provided they have requisite facilities. The following processes should be employed by recyclers:
  - (i) Manual / semi- automatic / automatic dismantling operations
  - (ii) Shredding / crushing / fine grinding/wet grinding/ enrichment operations, gravity/ magnetic/density/eddy current separation
  - (iii) Pyro metallurgical operations - Smelting furnace
  - (iv) Hydro metallurgical operations
  - (v) Electro-metallurgical operations
  - (vi) Chemical leaching

(vii) CRT/LCD/Plasma processing

(viii) Toner cartridge recycling

(ix) Melting, casting, moulding operations (for metals and plastics)

- A recycling facility may accept e-waste and even those electrical and electronic assemblies or components not listed in Schedule-I for recycling, provided that they do not contain any radioactive materials and same shall be declared while taking the authorisation from concerned SPCBs/PCCs;
- The recycling facilities shall comply with the requirements as specified for dismantlers in the guidelines for dismantling in section 6.0.
- A recycling facility shall install adequate wastewater treatment facilities for process wastewater and air pollution control equipment (off gas treatment, wet/alkaline/packed bed scrubber and carbon filters) depending on type of operations undertaken.
- De dusting equipment such as suction hood shall be installed where manual dismantling is carried out.
- Fume hoods connected with bag dust collectors followed wet (chemical) scrubbers and carbon filters shall be installed for control of fugitive emissions from furnaces or reactor.
- Noise control arrangement for equipment like crusher, grinder and shredder needs to be provided.
- The discharges from the facility shall comply with general standards under E (P) Act, 1986 for discharge of wastewater. Discharge standard are at Annexure IV
- In case of air emissions, the unit shall comply with emission norms prescribed under Air (Prevention and Control of Pollution) Act, 1981. In case of furnace, a minimum stack height of 30 meter shall be installed depending on emission rate of SO2. Emission Standards are at Annexure V.
- The workers involved in recycling operations shall use proper personal protective equipment such as goggles, masks, gloves, helmet and gumboot etc.

- Adequate facilities for onsite collection and storage of bag filter residues, floor cleaning dust and other hazardous material shall be provided and sent to secure landfill by obtaining membership of TSDF.
- The CRT / LCD / Plasma TV should be processed only at a recycler's facility.
- For recycling of CRT monitor and TVs care should be taken to contain release of harmful substances. The steps for processing of CRT are as below:

  (i) CRT monitors and TVs should be manually removed from plastic/ wooden casing. The CRT should be split into funnel and panel glass using different splitting technology such as Ni-Chrome hot wire cutting, Diamond wire method or Diamond saw separation in a closed chamber under low vacuum conditions (650 mm of Hg).

  (ii) The funnel section is then lifted off from the panel glass section and the internal metal gasket is removed for facilitating the removal of internal phosphor coating.

  (iii) The internal phosphor coating from the inner side of panel glass is removed by using an abrasive wire brush with suction arrangement under low pressure as given above at (i). The extracted air is cleaned through high efficiency bag-filter system and collected in appropriate labelled containers and then disposed at an authorised TSDF.

  (iv) Manual shredding, cutting, and segregation operations for CRTs should be carried out in low vacuum (650 mm of Hg) chambers where the dust is extracted through cyclones, bag filters, ID fan and a suitable chimney.

  (v) Segregated CRTs can also be shredded in mechanical/automatic shredding machines connected with dust control systems. The mixed shredded glass is separated into leaded glass and glass cullet using electro-magnetic field or by density separation.

- For LCD and Plasma TV a recycler should have sealed vacuum

dismantling platform for dismantling of LCD / Plasma panels. The LCD / Plasma TV should be dismantled piece by piece, starting with the removal of the plastic backing shell, printed circuit boards, aluminium or

steel frame, screen, PET plastics, LCD Panel and backlight. The metal frame, wire, other metallic material and plastic backing cabinet may be sent to recyclers with valid CTO. Printed Circuit Board and LCD panel may be recycled or in case recycling facility is not available then sent to respective authorised recycling facility.

- The user of the products obtained in the recycler facility should be identified and an agreement may be entered with them for selling of the products obtained in these recycling facilities. This is for tracking the product of recycling, to ascertain where the products are going.
- Recovery of resource and particularly of precious metals present in the e-waste should be given importance.
- For fluorescent and other mercury containing lamp recycling, the unit shall have at least following systems:

(i) Mechanical feeding system.
(ii) Mercury spill collection system.
(iii) Lamp Crushing System, under vacuum, for separation of mercury-contaminated phosphor powder & mercury vapors from other crushed components, so as not to cause release of any pollutant, including mercury vapor.
(iv) System for segregation of mercury vapour from the phosphor powder through a distillation system for separation & recovery of mercury.
(v) Air pollution control system (APCS) which shall include HEPA (High Efficiency Particulate Arrestor) filter system or activated carbon filter system or any other equivalent efficient system for separation/ removal of mercury vapor from mercury- contaminated phosphor powder'
(vi) Arrangement for disposal of mercury contaminated filter pads to

TSDF.

(vii) On line mercury monitoring system, to have check on emission of mercury, which has to be in compliance to the consented norms.

- The fluorescent and other mercury containing lamp recycling unit shall have following obligations:

(i) The emission outlet shall comply with the norms for mercury prescribed in the consent document. The norm for mercury emission is 0.2 mg/m^3 (Normal) as prescribed under E (P) Act, 1986 for mercury emission from other category of industries.

(ii) For discharge of effluent the limit for mercury as (Hg) should be less than equal to 0.01mg /liter as prescribed under E (P) Act, 1986.

(iii) The unit shall have trained / skilled manpower to handle hazardous substances such as mercury mixed phosphor in respect of treatment/recycling.

(iv) The unit shall dispose all the unrecoverable wastes from the treatment site, to a TSDF

(v) The unit shall maintain record of used fluorescent and other mercury containing lamp collected & recycled, recovery of mercury and other components. It shall, also, maintain the records pertaining to the generation, storage, transport and disposal of the wastes generated in the process.

(vi) The unit shall take up ambient air quality monitoring, particularly, in reference to mercury levels with a frequency of once in a month through a recognized laboratory, for third party verification.

Space requirement for Recyclers

As a general rule a recycler of capacity of 1 Ton per day shall require a minimum of 500 square meters area. Authorisation to recyclers may be preferred if they have minimum operational capacity of 5 MT/day with

an area of about 2500 square meter.

Guidelines for Refurbisher

- Refurbishment means repairing of used electrical and electronic equipment and it should be carried out in such a way that there should not be any damage to health and environment.
- A refurbisher has to obtain consent to establish under the Water (Prevention and Control of Pollution) Act, 1974, (25 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (21 of 1981) from the concerned State Pollution Control Board/Pollution Control Committee.
- A refurbisher has to obtain certificate of registration and proof of installed capacity from District Industries Centre or any other government agency authorised in this regard;
- A refurbisher has to obtain one-time authorization from concerned State Pollution Control Board/Pollution Control Committee.
- A refurbisher should have system to manage leakage of coolant/refrigerant gases and compressor oils from used electrical and electronic equipment during refurbishing operations.
- The refurbishing area should be ventilated and have proper dust control equipment.
- De-dusting system over refurbishment tables should be provided
- Any e-waste generated during refurbishment should be collected separately and sent to collection centre /authorised recycler. In case of refurbisher not having own collection centre, the e-waste so generated may be channelized to an authorised recycler.
- The premise for refurbishing should fulfil the following requirements:

  (i) Water proof roofing and impermeable surfaces

  (ii) As a general rule a refurbisher of capacity of 1 Ton per day shall require a minimum of 150 square meters' area for refurbishing, temporary storage of e waste generated and space for refurbished EEE

- If refurbisher opts to sell refurbished EEE then he is required to seek EPR authorisation from CPCB. In no circumstances, the refurbisher shall sell any refurbished EEE without having EPR authorization.

Guidelines for Consumers and Bulk Consumers

Consumers:

- The Consumers should channelised their e-waste through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler/recycler.
- The consumer should not throw e-waste in municipal bins.
- The consumers shall ensure that they do not throw end of life fluorescent and other mercury containing lamp in the municipal bin but hands them over (in a properly packed form) to take back system / collection and channelisation system of producer or to a collection centre of an authorised recycler who is part of producer channelisation system.
- The end of life intact fluorescent and other mercury containing lamp may be stored either in the same boxes in which new lamps are brought or other boxes of similar size. They should be sorted upright. The due precaution may be taken while packing more than one used lamp, so as not to cause the possibility of breakage during the storage and transpiration.

Bulk Consumers:

- The bulk consumers may ensure that e waste generated by them is handed over only to producer take back system or to authorised dismantler/recycler who is part of producers take back/channelisation system.
- The bulk consumers should ensure that used lamps are not disposed in the municipal bin but handed over (in a properly packed form) to take back system / collection and channelisation system of producer or to a collection centre of an authorised recycler who is part of producer channelisation system.
- The bulk consumers must create special type of disposal bins

(suitable for the purpose) at site for depositing the end of life intact fluorescent and other mercury containing lamp only. The management of the institute may issue necessary instructions, to ensure this, to staff and workers handling such lamps.

- The end of life intact fluorescent and other mercury containing lamp, as collected above, may be stored either in the same boxes in which new lamps are brought or other boxes of similar size. They should be stored upright. The due precaution may be taken while packing more than one used lamps, so as not to cause the possibility of breakage during the storage and transportation.

About this Manual

Under the Digital India Mission, the Ministry of Electronics and Information Technology (MeitY) has initiated a project "*Awareness Programme on Environmental Hazards of Electronic waste*". The programme aims to enhance awareness on the growing challenges and opportunities provided by e-waste.

This manual, for Manufacturers, is a part of a series of training materials prepared for all the relevant stakeholders involved in e-waste management in India. Through this programme and by publication of awareness materials, MeitY aims to develop standardized content for reaching out to the relevant stakeholders.

The focus group of this particular manual are manufacturers, a key stakeholder which is under the ambit of the rules. This manual intends to present the subject of e-waste and its multiple facets in a manner that simplifies the elements of e-waste for the users as well as help them with literature to implement the rules in a manner that they are in compliance with the guidelines to the rules.

The manual uses different methods to achieve the change objective including the Donna E. Walker's 'Learning Cycle' that has five steps including Mind Jog, Personal Connection, Information Exchange, Information Application and Real World Connection. This method takes into account that different learners have different learning abilities and at least one of the steps of the cycle would be able to transfer the learning effectively.

In addition it uses Harvard case method that involves presenting a case to students where they associate themselves with a role as they read through the situation and identify the problem. The next step is to perform the necessary analysis to determine the cause and possible solutions to the problem. The manual provides essential information and situations that form cases that can be discussed with the students by the trainer.

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