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## FOREWORD

## EXECUTIVE SUMMARY

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Technological innovation and intense marketing strategies engender a rapid turnover of electric and electronic equipment (EEE). At the same time, the lifespan of EEE is becoming shorter. Consequently, large amounts of waste EEE (WEEE) are constantly generated worldwide. The growing quantity of E-waste from the electronic industry is beginning to reach disastrous proportions (Wath et al., 2011). According to research studies, E-waste equals 1–3% of total solid waste worldwide (Robinson, 2009; UNEP, 2007).

In addition to the fact that economically developing countries themselves produce a share of the world's E-waste and WEEE, huge amounts of E-waste are being exported from developed countries to these same countries. As far back as 2006, scientific reports, approximately 80% of the e-waste of developed countries are exported to poor or developing countries (Schmidt, 2006). Nigeria ranks among the top ten importers of e-waste after China. The other major importers of E-waste are India, Pakistan, Vietnam, the Philippines, Malaysia, and Ghana (Robinson, 2009).

The exporting of E-waste and WEEE to poor and developing countries makes the subject of E-waste management more complicated, owing to environmental and health problems and because some recycled contaminated products associated with E-waste recycling are probably re-exported.

E-waste and WEEE contain substantial amounts of reusable materials, such as metals, that can be recovered in the form of secondary raw materials. Thus WEEE has relatively high residual value if recycled. However, e-waste and WEEE also contain significant amounts of hazardous substances, such as metals (for example, As, Ba, Be, Cd, Pb, Ni, and Cr), polychlorinated biphenyls (PCBs), and brominated organic compounds.

In view of the hazardous environmental impacts and the high residual value, management of WEEE has aroused worldwide attention in terms of legislations and technologies.

With this global trend, E-waste is one of the fastest-growing waste streams in Lagos State, owing to an increase in consumption of electrical and electronic equipment and being a major sea and air port routes for imported goods to Nigeria and the other West African states.

Nevertheless, as is the case in some other countries, E-waste management has not received sufficient attention. For the successful implementation of any waste management plan (including an E-waste management plan), the availability of sufficient and accurate information on the quantities and composition of the waste generated and on current management conditions is a fundamental prerequisite. At present, in Lagos state, there is no available and accurate information that describes the characteristics and generation rate of e-waste or the actual practice of management and handling of the waste.

Currently, despite the fact that there is a primary national legislation for e-waste management (as part of general electrical / electronics sector waste regulation) existing in Nigeria, this primary legislation is not fully implemented across the Federal States of the country.

In practical terms, there is no definite policy or plan for the allocation of funds to prepare suitable equipment and facilities for the management of e-waste.

It is against this backdrop that the Lagos State e- waste Policy has been developed to assist the State to engage a more strategic and cooperative approach to responding to the issues on e- waste, maximising any potential recycling benefits attributed to the inherent precious metals components of e- waste, and benefit from it been the main port of entry and exit of new or used electrical electronics and recovered metals from e waste.

The rationale of the Lagos State E waste Policy is to guide the State and other stakeholders on the implementation of collective measures to address the challenges and opportunities of e- waste, for the benefit of both present and future generations.

The policy thus represent the commitment of the State in putting in place harmonised and coordinated strategies, programmes and actions to manage e- waste in an environmentally sound manner, reduction of cost and environmental impact from e-waste, improve the efficiency of procurement, use, and end of life management of electronic equipment for sustainable socio-economic development.

Primary priority areas of this Policy are Green Procurement for New or Used Equipments; Producers Take back for e-Waste, Environmental Management System and Pollution Control for Facilities in Recovery, Recycling and Disposal Operations; Finance Mechanism for Producers Take Back and Governance.

One of the most attractive e-waste management policies is an extended producer responsibility (EPR) programme in combination with a training programme at different levels of society. An approach consisting of a mandated product take back is proposed for implementing EPR in the state with a targeted financing scheme rather than government subsidy. Thus, the extended producer responsibility with well-defined roles for all participants – producers, users, authorities and waste managers is essential for designing an effective WEEE management system.

This Policy conforms to the fundamental and operational principles of Lagos State set out in Chapter II (Fundamental Objectives and Directive Principles of State Policy) of the Constitution of the Federal Republic of Nigeria (1999). It also conforms to the principles of environmental law as envisaged in multiple environmental governance instruments including Edict No. 9 of 1996 to establish the Lagos State Environmental Protection Agency.

The Policy is in line with Nigeria's Constitution 1999. Among the provisions of the country's supreme law that the Policy addresses is on environmental protection (Article

20). Article 20 of the Constitution empowers the State to “protect and improve the environment and safeguard the water, air, land, forests and wildlife of Nigeria”.

The Policy complements various international conventions, treaties and protocols on environment and natural resources. In particular, the Policy is in line with the **Basel Convention, 1989** as well as other key Conference of the Parties (COP) decisions. The Convention came into force on 5 May 1992 in accordance with article 25(1) of the Convention.

The Basel Convention’s Conference of the Parties (COP) has made several decisions to achieve ESM of electrical and electronic waste. At its sixth meeting (COP6) in December 2002, electronic wastes were identified as a priority waste stream in the strategic plan for the implementation of the Basel Convention up to 2010. In 2006, the Basel convention’s eighth meeting of the COP (COP8) was held in Nairobi with the theme ‘Creating innovative solutions through Basel Convention for the environmentally sound management of electronic wastes’. As a result, the ‘Nairobi declaration on the Environmentally Sound Management of Electrical and Electronic Waste’ was adopted by COP8 as decision VIII/2.

Important global initiatives on e-waste include (1) initiatives to encourage private sector participation in ESM of e-waste. Launched in 2002, the ‘Mobile Phone partnership Initiative’ (MPPI), which has overall objectives for better product stewardship, changing consumer behaviour, promoting best reuse, refurbishing, material recovery, recycling and disposal options, and mobilizing political and institutional support for ESM.

(2) The ‘Solving the E-Waste Problem (StEP)’ initiative, officially launched on 7 March 2007, with aims to standardise the global e-waste recycling processes to harvest valuable components of WEEE, extend the life of products and markets for their reuse, and to harmonise world legislative and policy approaches to e-waste management; and

(3) The Partnership for Action on Computing Equipment (PACE) was adopted by the Basel Convention in June 2008. The main objective of the PACE is to provide new and innovative approaches for addressing emerging issues on used and end-of-life computing equipment.

The convention is focused on the control of trans-boundary movements of hazardous waste and their disposal. Nigeria ratified the convention in March.1991. Some major points on the convention are as follows:

- Minimize the amount and toxicity of hazardous waste generated
- Ensure Environmentally Sound Management as close as possible to the source of generation
- Prohibit import and export of hazardous waste
- Cooperate among parties for environmentally sound management of waste

Other related Multilateral Environment Agreements (MEAs) linked to the Policy that Nigeria is a Party to and therefore, that affect Lagos State, include are:

- Basel Convention on Transboundary Movement of Hazardous Waste and its Disposal, 1992 (Party, ratified in 1990)
- Ban Amendment (ratified in 2004. The Amendment has not yet entered into force)
- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991) (Signatory).
- Framework Convention on Climate Change, 1992 (Party, ratified in 1994).
- The Vienna Convention for the Protection of the Ozone Layer. Montreal Protocol on Substance that Deplete the Ozone Layer 1987 (Party, ratified 1991).
- The Stockholm Convention on Persistent Organic Pollutants (Party, ratified in 2004).

The Ministry of Environment (MoE) of the Lagos State Government will be responsible for implementation of the Policy, working in close collaboration with other key line ministries. The document recommends that various implementation instruments should be developed to operationalise the Policy. These include an elaborate State Action Plan.

The upgraded E waste Department within the LASEPA shall coordinate and manage the implementation of the Policy so as to enhance synergies and minimise duplication of efforts. It shall work jointly with existing relevant State and national governments' agencies, departments and institutions and others that may be established in the implementation of the Policy. As a coordinating institution, the Department shall be vested *inter alia* with mandates to design action plans, design relevant projects, promote the introduction of environmentally sound management of e-waste in education curriculum, and initiate relevant capacity building projects.

Overall, this Policy aims to:

- i. Establish a State governance framework to coordinate and harmonise the implementation of State-level e waste environmentally sound management activities and initiatives;
- ii. To identify all E-waste stakeholders within the State and establish the institution of a collaborative Public Private Partnership (PPP) model for E-waste environmentally sound management and decision making in Lagos State.
- iii. To assign rights and responsibilities of stakeholders under the E-waste environmentally sound management program.
- iv. To develop a legal framework for state - wide management of used electrical & electronic equipment as regards green procurement, consumption, generation, extended producers responsibility on take back option, collection, distribution, recycling and disposal.
- v. To Establish a Producer Responsibility Organization (PRO) for all local manufacturers, importers, distributors and resellers of electronic equipment where membership Fees will be charged to cater for the cost of collection and recycling

- vi. To develop enforcement mechanism for Product take-back system that requires Producers/ Assemblers/ importers and distributors/ sellers to take back old and end of life products.
- vii. To institute the funding mechanism/e-waste fund for initiatives of the e-waste program and apportioning financial obligations for Stakeholders in line with agreed models.
- viii. Facilitate resource mobilisation for the implementation of identified activities and initiatives on e waste management.
- ix. Identify priority action areas, for the (a)Prevention, minimization, recycling, recovery and disposal of E waste taking into account social, technological and economic concerns of the State;
- x. Promote capacity building efforts through *inter alia* education and training; public awareness; research and development; technology development and transfer; and information and knowledge management;
- xi. Promote research and observations through monitoring, detection, attribution and model prediction to manage e waste in an environmentally sound manner;
- xii. Support the mainstreaming of environmentally sound management into State planning, procurement and development processes;

A monitoring and evaluation (M&E) framework shall be developed as an integral component of the Policy implementation to ensure Policy goal and objectives are achieved and priority actions are implemented in a cost-effective, coordinated and harmonised approach. The upgraded e-waste Department of the Lagos State Environmental Protection Agency under the Ministry of Environment will develop tools and guidelines for monitoring and evaluating the implementation of the Policy.

The Policy will be reviewed every three years to take into account emerging issues, challenges, and trends at the local and national levels.

## 1.0. INTRODUCTION

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Today economic activity at governmental agencies, industrial facilities and institutions is increasingly occurring in an environment of information technology (IT). The rapid development of IT is transforming the nature of work. This new development is driven by technologies based on internet, high volume electronic data storage devices, wireless communications all based on electrical electronic equipment. As a result there is continuous generation of electrical and electronic waste. From a little over 450,000 connected lines in January 2001, the Nigerian Communications commission (NCC) has grown the information and communications technology (ICT) sector with a superlative result of some 134.5 million active lines. This phenomenal growth had in recent time led Nigeria to be ranked in the world as the fastest growing telecom market for a consecutive five years and continues to be in the top three till date (NCC May 2015). Furthermore from often cumbersome dial up internet that was available to a little close to 100,000 people including multinationals, government, embassies among others, there are now as of May 2015 over 66 million people with access to the internet. Internet connections are readily available on Smartphone's, iPads, modems laptops in offices and homes. Access to the internet, internet banking and online transactions has been demystified by the advent of faster connections. With these snapshots of achievements in the ICT sector is the attendant waste arising from obsolete, unwanted, or non working electrical electronic products.

Waste Electrical and Electronic Equipment (WEEE) or E-waste is one of the fastest growing waste streams in the world. It is a term for electronic products that have become unwanted, non-working or obsolete, and have essentially reached the end of their useful life. In developed countries, it equals 1% of total solid waste on an average and in developing countries, it ranges from 0.01% to 1% of the total municipal solid waste generation. In Nigeria though annual generation per capita is less than 1 kg, it is growing at an exponential pace in addition to the ever-growing hazardous waste stream. An estimated 53,600 metric tonnes of e- waste are dumped annually at Lagos state landfills which include 860,000 computers, 530,000 printers, 900,000 monitors and 480,000 television sets ( Lagos State, e waste summit 2011)

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. The composition of WEEE/ E-waste is very diverse and differs in products across different categories. It contains more than a 1000 different substances, which fall under “hazardous” and “non-hazardous” categories.

Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood 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. The presence of elements like lead, mercury, arsenic, cadmium, selenium, and hexavalent chromium and flame retardants beyond threshold quantities in WEEE / E-waste classifies them as hazardous waste.

WEEE/ E-waste dismantling or incineration is considered toxic. Therefore, they are targeted for reuse, recovery or hazardous waste disposal. The recovery of metals is a profitable business, which results in local, trans-boundary and global trade.

Due to its mega city status and the challenge of poorly-managed borders, Lagos State has become the dumping ground of E-waste in Nigeria. Moreover, because of its highly commercialized status and being the major sea and air ports entry to the country the state is facing enormous challenges in relation to the generation and management of E-waste which are either internally generated or imported illegally.

According to the Lagos State Government data, Lagos state is the smallest state in Nigeria, with an area of 356,861 hectares of which 75,755 hectares are wetlands, yet it has the highest population, which is over five per cent of the national estimate.

As at 2006, the population of Lagos State was 17.5 million, (based on the parallel count conducted by the state during the National Census) with a growth rate of 3.2%, the state currently has a population of over 21 Million. This was corroborated by the recent immunization exercise carried out across the State, where 4.3 million children were immunized. Children within the Immunization bracket are estimated at 20% of the entire population.

The UN estimates that at its present growth rate, Lagos state will be third largest mega city the world by Y2015 after Tokyo in Japan and Bombay in India.

Of this population, Metropolitan Lagos, an area covering 37% of the land area of Lagos State is home to over 85% of the State population.

The rate of population growth is about 600,000 per annum with a population density of about 4,193 persons per sq. km. In the built-up areas of Metropolitan Lagos, the average density is over 20,000 persons per square km.

Current demographic trend analysis revealed that the State population growth rate of 8% has resulted in its capturing of 36.8% of Nigeria's urban population (World Bank, 1996) estimate at 49.8 million people of the national million populations. The implication is that whereas country population growth is 4/5% and global 2%, Lagos population is growing ten times faster than New York and Los Angeles with grave implication for urban sustainability.

Thus Lagos State is the economically most important city of Nigeria and has a regional importance also for other West African countries as many internationally operating

companies have affiliates or headquarters in Lagos. With its two sea ports, Lagos also plays a major role for international trade as many goods originating in or destined for West Africa are channeled through the Tincan Island Port or Apapa Port.

The imported E-wastes are majorly sold (after it has been refurbished) in four different markets in Lagos (Alaba Market, Westminster Market, Ikeja Computer Village and Lawanson Market). This role as major population and business centre and hub for goods is also reflected in the amounts of e-waste generated and recycled within Lagos. Most of the imports of E-waste are channeled through the city of Lagos as it represents the biggest West African market for new and used electric and electronic equipment.

The 2010- 2012 E -waste country assessment survey provided the first documented data regarding the life span of certain appliances in Lagos State (Ogungbuyi 2012) . The household survey suggests that the average life span of category 1 appliances (e.g. refrigerators) is below ten years. Experiences from other studies (e.g. Amoyaw-Osei 2011) however demonstrate that these appliances have a longer life span. On the other side the assessed life span for the categories 2-4 seem to be in line with other assessment studies.

According to the survey households are holding almost 95% of installed EEE (**Error! Reference source not found.**) and are responsible for approx. 90% of WEEE arising. Altogether with corporate and institutional consumers WEEE generated in Nigeria sums up to 1.1 Mio tonnes for 2010, which is around 7 kg per capita. This is in a similar range as has been found in e.g. Ghana (Amoyaw-Osei 2011).

Environmental issues and trade associated with WEEE/ E-waste has driven the definition of WEEE/ E-waste both at national and international level.

E-waste contains hazardous materials such as lead, mercury, beryllium, cadmium, and brominated flame-retardants that pose both human and environmental health threat.

The possible health effects of exposure to some of the hazardous materials in e-waste are presented in Table 1.1.

TABLE 1.1: EFFECTS OF CHEMICALS IN E-WASTE ON HUMAN HEALTH

e-toxin	Source of e-toxin	Health effects
<b>Arsenic</b>	Found in computer chips and light emitting diodes	Arsenic is a known cancer-causing substance (carcinogen). It is known to cause skin and lung cancer.
<b>Brominated Flame Retardants</b>	Added to plastic to prevent fires	Brominated Flame Retardants act as hormone disrupters. Children exposed to these substances show increased risk to thyroid disease and neurobehavioral disease
<b>Cadmium</b>	Cadmium coating of contacts and switches in the CPU and monitors is used to prevent corrosion. It is found in NiCd batteries	Breathing high levels of Cd can cause lung damage and death. Long term exposure to low levels of Cd can cause elevated blood pressure and kidney damage. Cadmium is a known carcinogen.
<b>Chromium</b>	It is used as a hardener in plastics and a dye in pigments. It may be present in the coatings on some metal parts.	Chromium has a variety of effects depending how it enters the body. Chromium is a carcinogen if inhaled. Chromium may also cause DNA damage.
<b>Halogens</b>	Plastics and insulation	These substances are of concern because of the possibility that toxins such as dioxins and furans may be created and released burning.
<b>Lead</b>	Cathode-ray tubes (about 5 lbs.) and Solders	Initial symptoms of exposure are anorexia, muscle pain, malaise, and headache. Long-term exposure to lead decreases the overall performance of the nervous system. High level exposure causes brain damage and death.
<b>Mercury</b>	Old battery and switches. Flat screen have mercury containing fluorescent tubes.	Short term exposure to all forms of mercury causes lung damage, nausea, vomiting, diarrhoea, increases in blood pressure or heart rate, skin rashes, and eye irritation Long term exposure permanently damage the brain, kidneys, and developing foetus.
<b>Polyvinyl chloride (PVC)</b>	PVC plastic is used in the insulation f some cables used in ICT equipment.	When burnt it produces highly toxic dioxins; research is finding if PCV is a hormone disruptor.

Moreover, the presence of valuable recyclable components attracts informal and unorganised sector, the unsafe and environmentally risky practices adopted by them poses great risks to health and environment.

In Lagos State, the informal sectors have been central to the management of e waste. Their engagement starts from the point of collection and continues till the last stage in some capacity such as other steps/unit operations like E-waste processing, production/ end products. It has been reported that WEEE/E-waste is locally collected by local recyclers, scavengers, etc. without any legal framework

Every waste management practice generates GHG, both directly (i.e. emissions from the process itself) and indirectly (i.e. through energy consumption). However, the overall climate impact or benefit of the waste management system will depend on net GHGs, accounting for both emissions and indirect, downstream GHG savings.

At a global scale, the waste management sector makes a relatively minor contribution to greenhouse gas (GHG) emissions, estimated at approximately 3-5% of total anthropogenic emissions in 2005. However, the waste sector is in a unique position to move from being a minor source of global emissions to becoming a major saver of emissions. Although minor levels of emissions are released through waste treatment and disposal, the prevention and recovery of wastes (i.e. as secondary materials or energy) avoids emissions in all other sectors of the economy. A holistic approach to waste management has positive consequences for GHG emissions from the energy, forestry, agriculture, mining, transport, and manufacturing sectors.

The climate benefits of waste practices result from avoided landfill emissions, reduced raw material extraction and manufacturing, recovered materials and energy replacing virgin materials and fossil-fuel energy sources, carbon bound in soil through compost application, and carbon storage due to recalcitrant materials in landfills. In particular, there is general global consensus that the climate benefits of waste avoidance and recycling far outweigh the benefits from any waste treatment technology, even where energy is recovered during the process.

Although waste prevention is found at the top of the 'waste management hierarchy' it generally receives the least allocation of resources and effort. The informal waste sector makes a significant, but typically ignored, contribution to resource recovery and GHG savings in Nigerian cities,

There is a pressing need to address e-waste management particularly in Nigeria and Lagos State which is the main port of entry and exit of e-waste and recovered scraps.

For effective WEEE/E-waste management, Lagos State needs to quantify and characterize this waste stream, identify major waste generators, and assess the risks involved. A scientific, safe and environmentally sound management system, including policies and technologies, needs to be developed and implemented.

It is against this backdrop that the Lagos State E waste Policy has been developed to assist the State to engage a more strategic and cooperative approach to responding to the issues on e waste, maximising any potential recycling benefits attributed to the inherent precious metals components of e waste, and benefit from it been the main port of entry and exit of new or used electrical electronics and recovered metals from e waste.

The Policy, thus, represents the commitment of the State in putting in place efforts to address the challenges and opportunities of E waste, for the benefit of both present and future generations.

The Policy is guided by the precepts of international environmental law including the principle of sustainable development and other international environmental governance instruments such as the Basel Convention on Transboundary Movement of Hazardous waste.

The fundamental principle for development of this E-waste policy is based on the conceptual life cycle of electrical and electronic equipment (EEE) as given in Figure 1.1. The major feature in the policy is the definition of WEEE / E-waste and the sections/ blocks in the life cycle which need to be regulated. Where a section/ block of the life cycle falls outside the geographical boundary of Nigeria, then the WEEE/E- waste is governed by international conventions .e.g. Basel Convention on Transboundary Movement of Hazardous Waste and its Disposal. Where all sections/blocks of the life cycle falls within the geographical boundary of Nigeria or Lagos State then National / State policy/law/regulation drive the E-waste management.

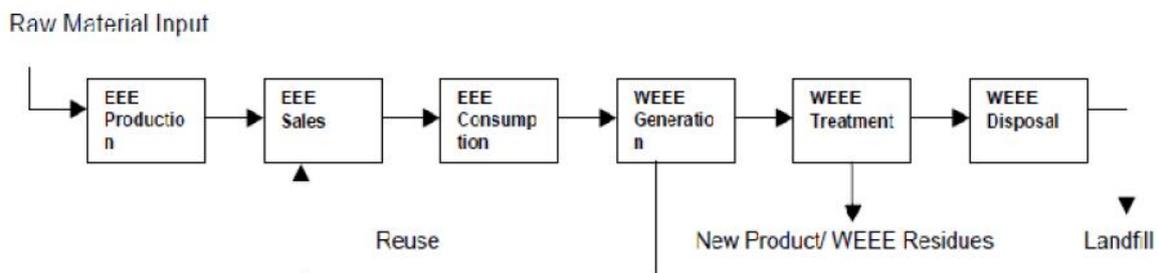


FIG 1.1: CONCEPTUAL LIFE CYCLE OF ELECTRICAL AND ELECTRONIC EQUIPMENT (EEE)

In this context, it is important to understand the existing national WEEE/ E-waste definition as stated below in relation to the conceptual life cycle

### 1.1. E- WASTE DEFINITION

**“Electronic waste or e-waste:** is a term for electronic products that have become unwanted, non-working or obsolete, and have essentially reached the end of their useful

life.” Categories of electrical / electronic items and items under each category covered under this definition is listed below

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### 1.1.1. CATEGORIES OF ELECTRICAL AND ELECTRONIC EQUIPMENT COVERED BY THIS DEFINITION

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1. Large household appliances
2. Small household appliances
3. IT 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

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### 1.1.2. LIST OF PRODUCTS, WHICH FALL UNDER EACH CATEGORIES

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**1. Large household appliances:** Large cooling appliances; Refrigerators; Freezers; Other large appliances used for refrigeration, conservation and storage of food; Washing machines; Clothes dryers; Dish washing machines; Cooking; Electric hot plates; Microwaves; Other large appliances used for cooking and other processing of food; Electric heating appliances; Electric radiators; and other fanning, exhaust ventilation and conditioning equipment.

**2. Small household appliances:** Vacuum cleaners; Carpet sweepers; Other appliances for cleaning; Appliances used for sewing, knitting, weaving and other processing for textiles; Iron and other appliances for ironing, mangling and other care of clothing; Toasters; Fryers; Grinders, coffee machines and equipment for opening or sealing containers or packages; Electric knives; Appliances for hair-cutting, hair drying, tooth brushing, shaving, massage and other body care appliances; and clocks, watches and equipment for the purpose of measuring indicating or registering time scales.

**3. IT and telecommunications equipment:** Centralized data processing; Mainframes; Minicomputers; Printer units; Personal computing; Personal computers (CPU, mouse, screen and keyboard included); Laptop computer (CPU, mouse, screen and keyboard included); Notebook computers; Notepad computers; Printers; Copying equipment; Electrical and electronic typewriters; Pocket and desk calculators; And other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means; User terminals and systems; Facsimile; Telex; Telephones; Pay telephones; Cordless telephones; Cellular telephones; Answering

systems; and other products or equipment of transmitting sound, images or other information by telecommunications.

**4. Consumer equipment; Radio sets;** Television sets; Video cameras; Video recorders; Hi-fi recorders; Audio amplifiers; Musical instruments; and other products or equipment for the purpose of recording or reproducing sound or image, including signals or other technologies for the distribution of sound and image than by telecommunications.

**5. Lighting equipment:** Luminaries for fluorescent lamps with the exception of luminaries in households; Straight fluorescent lamps; Compact fluorescent lamps; High intensity discharge lamps, including pressure sodium lamps and metal lamps; Low pressure sodium lamps; and other lighting or equipment for the purpose of spreading or controlling; light with the exception of filament bulbs.

**6. Electrical and electronic tools (with the exception large-scale stationary industrial tools): Drills;** Saws; Sewing machines; Equipment for turning, milling, sanding, grinding, sawing, cutting, shearing, drilling, making, holes, punching, folding, bending or similar processing of wood, metal and other materials; Tools for riveting, nailing or screwing or removing rivets, nails, screws; or similar uses; Tools for welding, soldering or similar use; Equipment for spraying, spreading, dispersing or other treatment of liquid or gaseous substances by other means; and tools for mowing or other gardening activities.

**7. Toys, leisure and sports equipment:** Electric trains or car racing sets; Hand-held video game consoles; Video games; Computers for biking, diving, running, rowing, etc.; Sports equipment with electric or electronic components; and coin slot machines.

**8. Medical devices (with the exception of all implanted and infected products):** Radiotherapy equipment; Cardiology; Dialysis; Pulmonary ventilators; Nuclear medicine; Laboratory equipment for *in-vitro* diagnosis; Analysers; Freezers; Fertilization tests; and other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability.

**9. Monitoring and control instruments:** Smoke detector; Heating regulators; Thermostats; Measuring, weighing or adjusting appliances for household or as laboratory equipment; and other monitoring and control instruments used in industrial installations (e.g. in control panels).

## 1.2 WEEE/ E-WASTE COMPONENTS

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Composition of WEEE/ E-waste components is very diverse and may contain more than 1000 different substances, which fall under “hazardous” and “non-hazardous” categories. Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood and plywood, printed circuit boards, concrete and ceramics, rubber and other items.

Iron and steel constitutes about 50% of the WEEE/ E-waste followed by plastics (21%), non - ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminum and precious metals ex. silver, gold, platinum, palladium etc. The presence of elements like lead, mercury, arsenic, cadmium, selenium, hexavalent chromium and flame retardants in WEEE/ E-waste and their components beyond threshold quantities as mentioned in Material Safety Data Sheet (MSDS) and the National solid and Hazardous waste regulations S.1.15 of 1991, classifies them as hazardous waste.

Since the recyclable potential of WEEE/ E-waste is specific for each appliance, the parts/materials found in WEEE/ E-waste have been divided broadly into following six categories.

- Iron and steel, used for casings and frames
- Non-ferrous metals, especially copper used in cables, aluminum and gold.
- Glass
- Plastic
- Electronic components
- Others (rubber, wood, ceramic etc.).

Therefore in order to curtail and manage the disposal of e-waste, there needs to be policies in place for the proper management of e-waste. This is because the existing management practices related to E-waste in Lagos State are relatively poor and have the potential to risk both human health and the environment. It has been observed in the State that electronic items are stored unattended because of inadequate knowledge about their management. Such electronic junks lie in houses, offices, warehouses etc and generally are mixed with household wastes, which are finally disposed of at landfills.

### 1.3. CATEGORIES OF HAZARDOUS WASTE UNDER THE BASEL CONVENTION

Basel Convention covers all discarded / disposed materials that possess hazardous characteristics as well as all wastes considered hazardous on a national basis. Annex VIII, of the convention refers to E-waste, which is considered hazardous under Art. 1, para. 1(a) of the Convention:

A1010: Metal wastes and waste consisting of alloys of any of the following:

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Lead
- Mercury
- Selenium
- Tellurium
- Thallium

A1020: Waste having as constituents or contaminants, excluding metal waste in massive form, any of the following:

- Antimony; antimony compounds
- Beryllium; beryllium compounds
- Cadmium; cadmium compounds
- Lead; lead compounds
- Selenium; selenium compounds
- Tellurium; tellurium compounds

A1030: Wastes having as constituents or contaminants any of the following:

- Arsenic; arsenic compounds
- Mercury; mercury compounds
- Thallium; thallium compounds

A1090: Ashes from the incineration of insulated copper wire

A1150: Precious metal ash from incineration of printed circuit boards not included on list B

A1170: Unsorted waste batteries excluding mixtures of only list B batteries. Waste batteries not specified on list B containing Annex I constituents to an extent to render them hazardous

A1180: Waste electrical and electronic assemblies or scrap containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or contaminated with Annex I constituents

(e.g., cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III.

Annex IX, contains the mirror entry, B1110 Electrical and Electronic assemblies given below.

- Electronic assemblies consisting only of metals or alloys
- Waste electrical and electronic assemblies or scrap (including printed circuit boards) not containing components such as accumulators and other batteries included on List A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or not contaminated with Annex 1.

A1190: Waste metal cables coated or insulated with plastics containing or contaminated with coal tar, PCB1, lead, cadmium, other organohalogen compounds or other Annex I constituents to an extent that they exhibit Annex III characteristics.

A2010: Glass waste from cathode-ray tubes and other activated glasses

#### 1.4. LINKAGES WITH STATE, NATIONAL AND INTERNATIONAL REGULATORY FRAMEWORK RELATED AND INFLUENCING E-WASTE

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The Policy takes cognisance of existing State and national (Federal) development and sectoral plans, policies and strategies. These include sectoral policies and strategies in environment, urban planning, energy, communication, consumption patterns management, among others..

The main aim of this section, therefore, is to highlight Nigerian legislation, guidelines and international conventions that are related and may influence e-waste management. The legislation outlined in the foregoing parts of this chapter are derived from the Nigerian Government laws and regulations, State Government laws as well as international conventions and other instruments that Nigeria is signatory to.

The Constitution of the Federal Republic of Nigeria (CFRN) of 1999 provides the general thrust of the nation's environmental policy through S.20 that provides; "the state shall protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria". Consequently, subsidiary laws and regulations have been made and international conventions and other instruments entered into pursuant to the constitution's set objectives.

These include:

- Laws and regulations, standards, policies, codes and recommended practices relating to the industry sector by the Nigerian Government and its Agencies such as the Federal Ministry of Environment, the National Environmental Standards and Regulatory Enforcement Agencies, and State's Ministry of Environment, Ministry of Physical Planning, and the Lagos State Environmental Protection Agency (LASEPA).
- International guidelines and conventions to which Nigeria is a signatory.
- National policy on Environment (1989) and reviewed in 1999.

#### **1.4.1. Specific Environmental legislation**

##### ***Environmental Impact Assessment (EIA) Act Cap 131 LFN 1992***

This law makes it mandatory to have an EIA study for any major development project likely to have adverse effects on the environment and seeks to encourage the development of procedures for information ex-change, notification and consultation between organs and persons when proposed activities are likely to have significant environmental effects on boundary or trans-state or on the environment of bordering towns and villages. The law prescribes the procedure for conducting and reporting EIAs.

##### ***Sectoral EIA Guidelines***

In September 1995, FEPA (now Federal Ministry of Environment) published Sectoral EIA Guidelines for Infra-structural Projects. The Guidelines are for any project that involves:

- Coastal Development Project
- Port and Harbour Development Project
- Railways
- Roads and Highways,
- Airports
- Urban development project
- Domestic water supply and sanitation project
- Electrification projects

This Act will influence major decision on setting up of recycling infrastructures on E waste in the state.

##### ***Land Use Act Cap 202 LFN 1990***

This legislation put an end to absolute ownership of land by individual and the community and vests "all land comprised in the territory of each state (except land vested in the Federal Government or its agencies) solely in the Governor of the state, who would hold such land in trust for the people.

##### ***The National Urban and Regional Planning Decree No 58 of 1992***

As earlier stated the physical planning dimensions of the management of solid waste cannot be underscored in terms of site location of industries and residential areas as well as site location for solid waste generation, collection and disposal resulting from activities in industrial and domestic sectors. The legislation provides for the creation of physical development plans at Federal, State and Local Government levels. Local government for example, is responsible for the preparation and implementation of a town plan, a rural plan, a local plan, a subject plan (section 4). The State relevance lies in the fact that inter-sectoral cooperation is required in compliance with legal provisions on physical planning especially by private developers and government units and agencies. Effective enforcement of the provisions of physical planning laws viz a viz E.I.A. Provisions at all governmental levels and in both private and public sectors would result in more efficient management of solid waste at source.

#### 1.4.2. **Air Related legislation**

Some of the Federal Regulations applicable at the State levels are:

- The National Guidelines and Standards for Environment Pollution Control in Nigeria (March, 1999), which is the basic instrument for monitoring and controlling industrial and urban pollution.
- The National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations S.I.9 of 1991, which imposes restrictions on the release of toxic substances and stipulates requirements for monitoring of pollution; it also makes it mandatory for existing industries and facilities to conduct an environmental audit.
- Air Quality Standards (FEPA, 1991): there are ambient air quality limitations and standards in Nigeria enforced by the FMENV, NESREA and LASEPA.
- National Environmental (Permitting and Licensing system) Regulations S.1 No 29 of 2009.
- National Environmental (Ozone Layer Protection) Regulations S.1 No 32 of 2009. The regulations imposes prohibition on ozone depleting substance and the release of ozone depleting substances through importation, manufacture in part or in whole, installation, or offer for sale or buying of new or refurbished facilities intended to be used for the production of any ozone depleting substances (ODS), unless recovery and recycling of substances already in use.
- National Environmental (Mining and Processing of Coal, Ores and Industrial Minerals) regulations S.1 No 31 Of 2009: The regulation is to minimize pollution from the mining and processing of coal, ores, and industrial minerals. It stipulates new development in the mining and processing techniques shall apply up to date, efficient cleaner technologies to minimize pollution to the highest degree practicable.
- National Environmental (Noise Standards and Control) Regulations, S.1 No 35 of 2009: The purpose of the these regulations is to ensure maintenance of a healthy environment for all people in Nigeria, the tranquility of their surroundings and their psychological well being by regulating noise levels and generally, to elevate the standard of living of the people by:
  - o Prescribing the maximum permissible noise levels a facility or activity to which a person may be exposed;
  - o Providing for the control of noise and for mitigating measures for the reduction of noise; and
  - o Generally for giving effect to the provisions of section 22 of the NESREA Act.

#### 1.4.3. **Water related legislation**

With regard to effluent standards, and arising Sewage, The National Environmental Protection (Effluent Limitation) regulations S.1.8 of 1991, which makes it mandatory for industrial facilities to install anti-pollution equipment, makes provision for effluent treatment and prescribes maximum limits of effluent parameters allowed for contraventions. It also provides that all industries in Nigeria should be operated on the basis of Best Available Technology (BAT).

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#### 1.4.4. SOLID WASTE RELATED LEGISLATION

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##### ***The Hazardous waste (Criminal Provisions) Decree No 42 of 1988***

The law prohibits the carrying, depositing and dumping of harmful waste on any land, territorial waters and related matters. It prohibits activities relating to harmful wastes, and lists such activities.

##### ***The National Environmental Protection (Waste Management) Regulations S.I.15 of 1991***

The law regulates the collection, treatment and disposal of solid and hazardous waste from municipal and industrial source.

##### ***National Environmental (Sanitation and Wastes Control) Regulation S.I.28 of 2009.***

This regulation applies to issues in environmental sanitation and all categories of wastes including e-waste. It regulates the adoption of sustainable and environment friendly practices in environmental sanitation and waste management to minimize pollution.

It stipulates further the obligation of all manufacturers and importers of a various brands of products to comply with a product stewardship program and extended producers responsibility programme. In particular e-waste becomes amenable to extended producers responsibility programme from January 2011

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#### 1.4.5. SOCIAL LEGISLATION

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Nigeria's legal system is based on the English common law, which continues to apply except to the extent it has been modified by statute. In relation to freedom of association and right to collective bargaining, forced labour and child labour, Government programmes to foster employment and alleviate poverty, Legal status of migrants including issuing of work permits and the termination of employment, the most important statutes are the Labour Act 1974 (LA) (also known as the Labour Decree 1974), as amended, and the Trade Disputes Act 1976 (TDA).

##### ***Consumer Protection Council Establishment Decree No 66 of 1992.***

The Consumer Protection Council is the apex consumer protection agency of the Federal Government of Nigeria established to promote and protect consumers' interests.

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#### 1.4.6. ENVIRONMENTAL LEGISLATION IN LAGOS STATE

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The challenge of environmental management and regulation is immense in a state that has a megacity such as Lagos. Over the years, legislation has evolved. With the enactment of the Environmental Pollution Control Edict, 1989 and the Lagos State Environmental Protection Agency, Edict 9 of 1997, the Environmental Sanitation Edict of 2002, the various rules and notifications, and the State Environment Policy, a credible legislative and policy base has been created.

The Lagos State Environmental Protection Agency, Edict 9 of 1997 in particular specified the responsibilities and functions of the Agency which include:

- a) Advising the State Government on all environmental management policies.
- b) Giving direction to the affairs of the Agency on all environmental matters.
- c) Preparing periodic master plan to enhance capacity building of the Agency and for the environment and natural resources management.
- d) Carrying out appropriate tests on insecticides, herbicides and other agricultural chemicals.
- e) Carrying out public enlightenment and educate the general public on sound methods of environmental sanitation and management.
- f) To monitor and control disposal of solids, gaseous and liquid wastes generated by both government and private facilities in the State.
- g) Monitoring and controlling all forms of environmental degradation from agricultural, industrial and government operations.
- h) Setting, monitoring and enforcing standards and guidelines on industrial effluent, air emissions (vehicular & stationary).
- i) Surveying and monitoring surface, underground and potable water, air, land and soil environment in the State to determine pollution level in them and collect baseline data.
- j) Promoting co-operation in environmental science and technologies with similar bodies in other countries and international bodies connected with the protection of environment, and
- k) Co-operation with the Federal, State and Local Governments, statutory bodies and research agencies on matters relating to environmental protection.

All the states in Nigeria have power to make laws with respect to the environment. This is because the subjects relating to the environment are contained in the Concurrent Legislative List. Other relevant States Statutory Laws, Regulations, Legislations and Guidelines related to industrial activities include the following.

- Lagos State Environmental Law, 1994 as amended in 1997
- Lagos State Sanitation Edict, 2002
- The Lagos State Town and Country (Building) Plan Regulations Of 1986
- Lagos State Urban and Regional Planning Board Law 1997
- Lagos State Urban and Development Regional Planning and Development Law Of 2005.

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#### 1.4.7. SPECIFIC E-WASTE MANAGEMENT LEGISLATION

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There are Regulations which may be cited as **the National Environmental (Electrical/Electronics Sector) Regulations S.I. No. 23, adopted in 2011.**

The principal thrust of the Regulations is to prevent and minimize pollution from all operations and ancillary activities of Electrical/ Electronic Sector to the Nigerian environment. The Regulations are based on life cycle approach and shall cover all the aspects of the electrical/electronic sector from cradle to grave.

Also the Regulations are anchored on the 5Rs ('Reduce, Repair, Recover, Recycle and Re-use,') principle as the primary drivers of the sector and shall encompass all the categories and lists of electrical/electronic equipment.

NESREA also developed a guide for importers of used EEE into Nigeria, which contains the guiding principles, requirements for import of used EEE, and the description of items that are not allowed to be imported to Nigeria. According to this guide, all importers of used EEE in Nigeria are required to register with NESREA.

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#### 1.4.8. INTERNATIONAL GUIDELINES AND CONVENTIONS

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Nigeria is a signatory to several international conventions and treaties that promote the maintenance of a viable environment and achieving sustainable development. The Federal Ministry of Environment is the Focal Point and Designated National Authority for the implementation of a number of the international conventions. The ones relevant to the E-waste and therefore, that affect Lagos State, are:

- Basel Convention on Transboundary Movement of Hazardous Waste and its Disposal, 1992 (Party, ratified in 1990)
- Ban Amendment (ratified in 2004. The Amendment has not yet entered into force)
- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991) (Signatory).
- Framework Convention on Climate Change, 1992 (Party, ratified in 1994).
- The Vienna Convention for the Protection of the Ozone Layer.  
Montreal Protocol on Substance that Deplete the Ozone Layer 1987 (Party, ratified 1991).
- The Stockholm Convention on Persistent Organic Pollutants (Party, ratified in 2004).

#### 1.5. RATIONALE AND JUSTIFICATION

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Nigeria is home to the largest second hand electronic market in Africa. Lagos the commercial and industrial hub of Nigeria, has been the victim of this unwholesome development in E-waste, partly because of the presence of the seaport in the state and the presence of major markets for these hazardous materials, especially the Alaba market and Computer Village in Ikeja and also the urge of People for second hand products. Estimated 500 shipping containers with a load equal in volume to 400,000 computer monitors or 175,000 large television sets enter Lagos each month, with as much as 75 per cent of some shipments classified as E-waste.

End of life EEE or E-Wastes are processed and disposed using crude methods such as dumping in open land spaces or refuse dumps as well as open burning (as currently operational in Computer Village, Alaba International Market, Ojota, and Olusosun umpsite in Lagos metropolis). The rate at which scavengers are found on the heaps of

the electronic wastes show that some of the electronic users do not understand the hazards associated with the use of faulty electrical/electronic equipment dumped haphazardly at electronic markets and dumpsites. It is however, unfortunate that E-Wastes contain hazardous chemical substances which include heavy metals: lead mercury, cadmium and persistent organic pollutants such as polychlorinated biphenyls (PCBs) and brominated flames retardants (BRFs). These toxic chemicals may be released into the environment with the crude disposal methods in use and in the process cause high risks to human health and the environment as some of these toxic constituents are carcinogenic and endocrine disruptors.

EEEs are made of a multitude of components, some containing toxic substances that have an adverse impact on human health and the environment if not handled properly. Often, these hazards arise due to the improper recycling and disposal processes used. It can have serious repercussions for those in proximity to places where e-waste is recycled or burnt. Waste from the white and brown goods is less toxic as compared with grey goods. A computer contains highly toxic chemicals like lead, cadmium, mercury, beryllium, BFR, polyvinyl chloride and phosphor compounds which are hazardous to human health. It can cause lung disease called beryllicosis or lung cancer, primarily through inhalation; damage to vital organs such as the brain and kidneys.

Existing policies, programmes, actions and measures are insufficient to address the level of risk posed by e waste issues. Weak technical capacity and lack of appropriate institutional framework and governance instruments particularly at the State level are additional challenges

Given the above context, the maiden State e waste Summit held in Lagos City on 24<sup>th</sup> - 25<sup>th</sup> February 2011 recommended a number of actions needed to address the adverse impacts of e waste challenges and take advantage of its opportunities. In particular, the Summit recommended the preparation of a statewide effective policy, law and regulation to guide the State's actions on e waste management.

## 2.0. GOALS AND OBJECTIVES

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### GOAL

The overall goal of the Policy is to foster sustainable development in the State through environmentally sound management of e- waste, reduction of cost and environmental impact from e waste, improve the efficiency of procurement, use, and end of life management of electronic equipment.

### 2.1. POLICY OBJECTIVES

The purpose of the Policy is to guide the State and other stakeholders on the implementation of collective measures to address e waste issues, challenges, impacts and opportunities in an environmentally sound manner, while assuring sustainable socio-economic development.

The overall objectives of the policy are anchored on Environmentally Sound Management which is a “Scheme for ensuring that wastes and used and scrap materials are managed in a manner that will:

- save natural resources,
- and protect human health and the environment against adverse effects that may result from such waste and materials”

Towards this end, the following pillars of environmentally sound management such as **Green Procurement for New or Used Equipments; Producers Take back for E-Waste, Environmental Management System and Pollution Control for Facilities in Recovery, Recycling and Disposal Operations; Finance Mechanism for Producers Take Back and Governance will be priority areas of action.**

#### **The Specific Objectives of the Policy are to:**

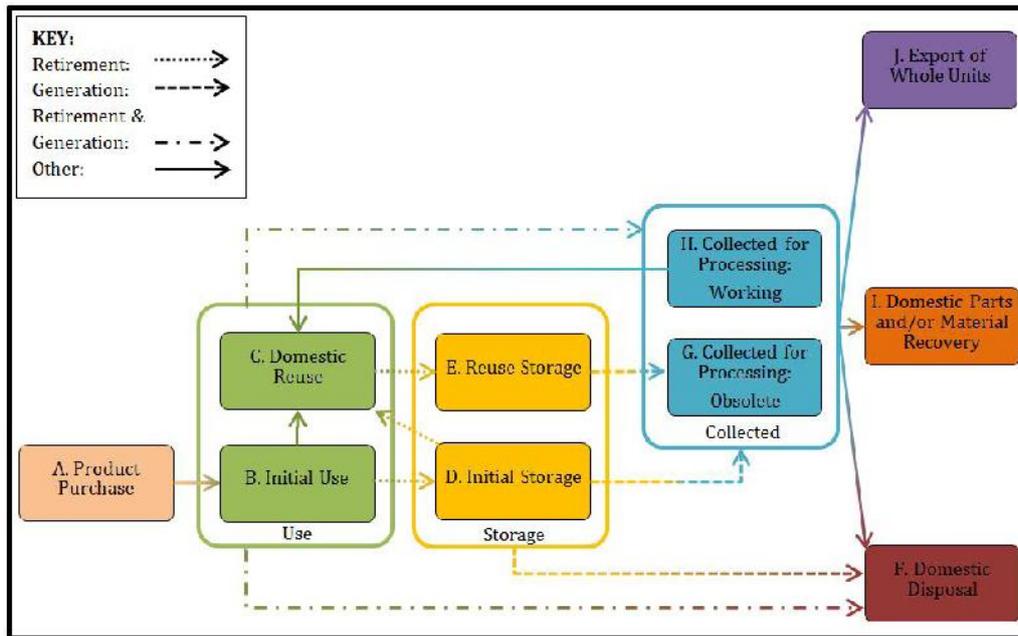
- xiii. Establish a State governance framework to coordinate and harmonise the implementation of State-level e waste environmentally sound management activities and initiatives;
- xiv. To identify all E-waste stakeholders within the State and establish the institution of a collaborative Public Private Partnership (PPP)model for E-waste environmentally sound management and decision making in Lagos State.
- xv. To assign rights and responsibilities of stakeholders under the E-waste environmentally sound management program.
- xvi. To develop a legal framework for state - wide management of used electrical & electronic equipment as regards green procurement, consumption, generation, extended producers responsibility on take back option, collection, distribution, recycling and disposal.
- xvii. To Establish a Producer Responsibility Organization (PRO) for all local manufacturers, importers, distributors and resellers of electronic equipment where membership Fees will be charged to cater for the cost of collection and recycling

- xviii. To develop enforcement mechanism for take-back system that requires Producers/ Assemblers/ importers and distributors/ sellers to take back old and end of life products.
- xix. To institute the funding mechanism/e-waste fund for initiatives of the e-waste program and apportioning financial obligations for Stakeholders in line with agreed models.
- xx. Facilitate resource mobilisation for the implementation of identified activities and initiatives on e waste management.
- xxi. Identify priority action areas, for the (a)Prevention, minimization, recycling, recovery and disposal of E waste taking into account social, technological and economic concerns of the State;
- xxii. Promote capacity building efforts through *inter alia* education and training; public awareness; research and development; technology development and transfer; and information and knowledge management;
- xxiii. Promote research and observations through monitoring, detection, attribution and model prediction to manage e waste in an environmentally sound manner;
- xxiv. Support the mainstreaming of environmentally sound management into State planning, procurement and development processes;

## 2.2. POLICY APPLICABILITY AND SCOPE

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This Policy shall apply to every Producer, Consumer or Bulk consumer, Collection centre, Importer, Exporter, Dismantler of Electrical and Electronics, and Recycler of e-waste involved in the manufacture, refurbishing, repairs, sale, purchase and processing of electrical and electronic equipment or components as indicated in the flowchart of life cycle of electronics in figure 1.1. It encompasses Electrical and electronic wastes, from municipal, commercial and industrial, construction and governmental establishment waste streams.



**Figure 2.1: Life Cycle Flow Chart of Electronic Products**

### 2.3. POLICY GUIDING PRINCIPLE

This Policy conforms to the fundamental and operational principles of Lagos State set out in Chapter II (Fundamental Objectives and Directive Principles of State Policy) of the Constitution of the Federal Republic of Nigeria (1999). Article 20 of the Constitution gives every state within the Federal Government the mandate to “protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria”. It is also in line with the principles of environmental law as envisaged in a number of environmental governance instruments including Edict No. 9 of 1996 to establish the Lagos State Environmental Protection Agency, among others.

The Policy is also guided by the following principles and concepts:

- i. **Human life and environment protection:** The government shall ensure safety of citizens and the environment from hazardous materials embodied in electronic equipment.
- ii. **Globalization:** The policy implementation shall take into consideration best available recycling technologies on a global level.
- iii. **Community participation:** Government shall encourage citizen participation.
- iv. **Public Private Partnership:** The Government shall recognize the contribution of the private sector.

**The key principles that underpin the policy are:**

- i. Management of all Electrical /electronic wastes, including hazardous wastes, in line with Nigeria’s international obligations

- ii. Environmentally responsible management of e- waste to reduce greenhouse gas emissions and contribute to broader sustainability outcomes
- iii. Holistic approaches which address market, regulatory and governance failures, duplications and inconsistencies
- iv. Evidence-based decisions informed by the waste management hierarchy of actions and the principles of ecologically sustainable development, including the precautionary approach and the principle of intergenerational equity
- v. Participants in the product supply and consumption chain, rather than the general community, bear responsibility for the costs of resource recovery and waste management
- vi. The environmentally sound management of materials, products and services embracing whole-of-life cycle strategies and quality assurance practices
- vii. Avoidance or minimization of hazardous and other waste generation, taking account of social, technological and economic factors
- viii. Minimization of intergenerational legacy issues through understanding and management of the risks
- ix. Regular provision of State -wide consistent and comprehensive data on waste and re-use of materials to assess performance and inform policy
- x. Consideration of overall community benefits taking account of social, environmental and economic outcomes for any measures, whether voluntary or regulatory; and
- xi. Implementation of policy by the appropriate level of government, industry or the community.

#### 2.4. E- WASTE OVERARCHING POLICY STATEMENT

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The Lagos State government shall in line with her environment policy and commitments, minimize any impact arising from e waste from industrial, commercial activities and consumption patterns in the state on the environment; and shall take all appropriate measures to ensure that waste electrical and electronic equipments (WEEE) are not littered on the Lagos State environ and shall be deposited in proper waste containers to promote effective and efficient collection, reuse and proper recycling of WEEE in well-engineered facilities consistent with the principles of product stewardship and in an environmentally safe and economically productive manner

### 3.0. POLICY PRIORITIES

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This policy aims to promote identification and implementation of environmentally sound Management and technologies (ESTs) for the e-waste programme. Environmentally sound management is “a scheme for ensuring that wastes and used and scrap materials are managed in a manner that will save natural resources, and protect human health and the environment against adverse effects that may result from such wastes and materials”.

Environmentally Sound Management applies to all kinds of waste, whether hazardous or non-hazardous. Environmentally Sound Management covers the following activities: disposal, storage (temporary storage only), the recovery of wastes, used and scrap materials, including subsequent disposal of residues from recovery operations, or in other words, all activities in relation to waste and used and scrap materials which are likely to harm the environment and human health if not properly managed.

This means in practice that recommendations on Environmentally Sound Management affect a landfill site just as well as a municipal waste incinerator and just as well as a recycling plant and waste collectors.

Nearly all of the substances of concern in a personal computer or any electrical electronic equipment are not dangerous in ordinary use and handling through normal contact. However human health and environmental concerns related to substances in a personal computer or electrical electronic equipment arise if this used equipment is land disposed or incinerated.

Towards this end, the following pillars of environmentally sound management such as Sustainable **Green Procurement for New or Used Equipments; Environmental Management System and Pollution Control for Facilities in Recovery, Recycling and Disposal Operations; Producers Take back for E-Waste, Finance Mechanism for Producers Take Back and Governance will be priority areas of action.** The priority areas will be supported by critical capacity building which cut across different sectors: finance; technology development and transfer; education, training and public awareness; and information and knowledge management systems on the major elements of e waste management from collection, segregation, through recycle, recovery, treatment, transportation and disposal.

#### 3.1. SUSTAINABLE GREEN PROCUREMENT

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General operating cost whether in services or industrial or commercial activities include energy costs which may be reduced if energy efficient products are purchased. Furthermore future disposal cost may be avoided or shared by arranging for take back of equipment and packaging at procurement phase.

Electronic equipment includes computers, monitors, servers, printers, copiers, fax machine, television and related office equipment. From design to disposal electronic equipments affect the environment.

Electronic equipment especially products that include CRTs, printed wire boards, mercury switches, capacitors and batteries - contains persistent toxic materials such as mercury, lead cadmium and chromium, all of which pose a threat to the environment when not managed properly. A typical 17 inch desktop colour monitor contains about 1.13kg of lead. Lead and Cadmium are used in circuit boards; Lead oxide and barium are found in Monitor CRTs; mercury is found in switches and flat screens monitors; brominated flame retardants can be found on printed circuit board, plastic casing and cables insulation; and Polyvinyl chloride (PVC) a soft plastic used in cables and wire (producing dioxin when burned due to the presence of chlorine).

In addition, the operation of office equipment or home appliances requires the use of batteries that contains heavy metals (lead, cadmium, lithium or silver) as well as toner cartridges and waste ink cartridges that contain toxic substances.

**Three major categories of environmental attributes need to be considered in the purchase of electronic equipment. These are energy efficiency, materials efficiency and toxics reduction.**

**Procurement policies that are established up front will minimize the toxic substances entering the waste stream from manufacture use, reuse and disposal phases. These provides a feedback loop to manufacturers while providing incentives for design for recycling, disassembly and longevity and the inclusion of reduced toxics in the manufacturer's process.**

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### 3.1.1. SUSTAINABLE GREEN PROCUREMENT OBJECTIVE

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Set up and support technology interventions that facilitate appropriate and environmentally friendly technologies for collection, storage, recycling, treatment and final disposal of E-waste.

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### 3.1.2. SUSTAINABLE GREEN PROCUREMENT POLICY STATEMENT

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The State shall subscribe to Sustainable green procurement principles and practices across and within government operations with respect to electrical and electronic goods.

The State shall aim to promote Energy efficiency, Materials Efficiency and Toxics Reduction as part of parameters to achieve Sustainable procurement principles and practices in the State.

- **Promoting Energy Efficiency**

Energy efficiency is defined as minimizing the consumption of energy, which in turn minimizes associated environmental impact. How an electronic product is designed, set up and used helps to determine its energy efficiency.

### **Policy Statements:**

Therefore the state shall:

- i. Maximise energy efficiency through the procurement of electronic products that are designed to be energy efficient;
- ii. Procure computers/ hardwares electronic /electrical goods with energy star or similar labeled vendors who are likely to take back e waste in the future;
- iii. Purchase equipment with energy star / or similar labeled vendor with modes active on delivery;
- iv. Procure Network equipment such as scanners copiers, printers, fax machines and other multifunction devices whenever possible to reduce energy usage.

- **Promoting Materials Efficiency**

Materials efficiency is defined as minimizing consumption and processing of materials, which in turn minimizes the associated environmental impacts such as waste generation and natural resources consumption.

### **Policy Statements**

Therefore the state shall:

- i. Encourage packaging reduction or use of recycled packaging in the course of purchasing from suppliers. Thus reducing statewide waste management activities.
- ii. Encourage extended product lifetime by reducing the need to purchase new product and disposing of surplus products. Upgrading instead of replacing old products, encouraging internal reuse, proper orientation and maintenance and networking equipment help promote an extended product life, reducing waste generation and materials consumption
- iii. Minimize generation of e waste by extending the useful life of computers /hardwares and all electronic/ electrical goods to a minimum of 4-5 year
- iv. Encourage procurement of products designed for ease of recycling and reuse at the end of life, this reduces waste generation and enables surplus property managers to send materials into a recycling loop. This may be done by identifying suppliers who will opt for take back or lease option. Another option is to establish a memorandum of understanding with a local recycling facility for refurbishment, or recycling.
- v. Encourage procurement of products from original equipment manaufaturere that embraces green design for resuse and for recycling.

- vi. Develop creative strategies for materials efficiency across the state in homes, business and institutions
- vii. Institute recovering the maximum amount of materials from waste streams
- viii. Foster a robust economy for secondary ( recovered ) raw materials to include formalization of the informal sectors currently engaged on e-waste.

### **Promoting Toxic Reduction**

Electronic equipment emissions- copiers and laser printers are sources of volatile organic compounds VOCs, ozone and particulate emissions which may be controlled through proper design, ventilation and maintenance. Also copiers emit ozone from electrically charged corona wires used in imaging system which increases with temperature and double sided copying.

### **Policy Statement**

The state shall put in place guidelines and procedures for procurement, IT, Maintenance, disposal /surplus managers to:

- i. Purchase equipment with reduced level of toxic or hazardous constituents
- ii. Purchase Laser printers and copiers with low indoor air pollution ( for large copiers look for the ones with ozone filters or that comes with activated carbon filters)
- iii. Request that the vendor collect, refills, or recycle the toner cartridges
- iv. Request the recycled content material in electronic equipment
- v. Purchase remanufactured toner cartridges for printers and fax machine.
- vi. Request that the regular servicing of copiers includes charging electrodes and activating carbon filters
- vii. Ensure that operating equipments are installed well ventilated rooms or six room fresh air changes per hour.
- viii. Monitor manufacturer's reduction in use of toxics materials towards reduction of the impact of the equipment on health and safety during the manufacturing and end of life phases.
- ix. Replace carbon filters in laser printers and copiers regularly as indicated by manufacturer's specification.
- x. Use rewritable CDs as 'low waste' tool for storing data from regular backups
- xi. Reuse 3.5'disks over again.
- xii. Use reusable products instead of disposable ones- use rechargeable batteries instead of single use batteries, and refillable toner and ink cartridge.

### 3.2. ENVIRONMENTAL MANAGEMENT SYSTEM AND POLLUTION CONTROL FOR FACILITIES IN RECOVERY, RECYCLING AND DISPOSAL OPERATIONS

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There are growing concerns that most of the e-waste generated in developed countries is ending up in developing countries that are economically challenged and lack the infrastructure for environmentally-sound management (ESM) of e-waste resulting in adverse socio-economic, public health and environmental impacts from toxics in e-waste.

Activities concerning electronic waste (e-waste) are emerging as a global concern as they can contribute to the release of persistent toxic substances (PTSs) into our environment and thus into the food web.

In contrast to the formal e-waste recycling practices in industrialized countries, practices currently operating in Lagos States is the adoption of rudimentary recycling practices to deal with the high amounts of e-waste imported from industrialised countries, as well as from domestic production. Open burning of e-waste is widely used to recover metals, such as steel, aluminium and copper from wires, capacitors and other components of e-waste. The informal recycling sector is very active in the State where harmful techniques in de-soldering circuit boards to recover valuable metals are very common. Open dumping of non-valuable fractions is also common, and has caused significant environmental and health impacts. E-waste activities are undertaken by men, women, and children with little or no consideration to protection of health and the environment. Although those working in this industry may be aware of the threats to their health resulting from these crude practices, they may often ignore these dangers for the benefit of earning an income. These e-waste activities cause severe damage to the environment and expose the workers and local residents to toxic chemicals through inhalation, dermal exposure, and oral intake (of contaminated food). Once taken into the body, toxic organic chemicals are stored in fatty tissues, bioaccumulate, and increase the body burden of persistent toxic substances. Figure 3.1 illustrates the health risk implications of improper disposal of e-waste.

The current WEEE recycling system and channels have been developed by chance, spontaneously and haphazardly responding primarily to market demand, with no standards for recycling practitioners, methods or prices, it lacks a coherent, overall strategy encompassing financially viable, environmentally benign and safe management methods. In the State there is almost a complete lack of effective supervision, regulatory systems or legal frameworks to control the processing of WEEE.

The lack of widespread and easily accessible recycling channels has also contributed to the excessive and inefficient re-use of waste household appliances, highlighting the urgent need to establish a sophisticated management system to standardize the market.

Consequently, the establishment of effective and pragmatic recycling systems for WEEE, and the enactment of regulations to implement these systems and enforce compliance, should be of vital importance.



the reason why this policy on e – waste has outlined the Core Performance Elements within the ISO 14000 Environmental Management System (EMS) so that, with minimum manpower and funds, the EMS for Environmental Sound Management can be implemented following the steps provided in these texts in all the small and medium scale facilities in the State.

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### 3.2.1. ENVIRONMENTALLY SOUND MANAGEMENT AND POLLUTION CONTROL OBJECTIVE

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Promoting the establishment and management of a formal system to implement programs to provide:

- (a) for the proper Handling and Processing of imported WEEE in the state, irrespective of whether this is EEE re-used from the developed world or purchased new locally, and
- (b) Management of hazardous wastes from WEEE processing.

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### 3.2.2. ENVIRONMENTAL MANAGEMENT SYSTEMS AND POLLUTION CONTROL POLICY STATEMENT

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The State shall require compliance with Environmental Management Systems for Recovery, Recycling and Disposal operations in line with ISO 14000 Core Performance Elements as stipulated in the policy.

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### 3.2.3. DEVELOPING AN EFFECTIVE E-WASTE HANDLING SYSTEM

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To deal with the generation of e-waste, effective management practices must be implemented throughout the entire life-cycle of the product –from the design stage (cradle) to the end-of-life stage (grave) – adopting solutions that are environmentally friendly, including practicing reuse or recycling.

#### **Policy Statements**

The State shall need to:

- i. Undertake an inventory and assessment of E-waste quantification and characterization as well as of current management practices. *(Waste generation figures do not necessarily reflect quantities of waste disposed). However, waste generation figures are important figures for planning of the collection, recycling and treatment infrastructure. E-waste disposal figures, on the other hand, indicate the scale of resource wastage and represent the recovery potential of the waste stream. The estimate of future obsolete streams is one of the crucial issues for the establishment of an efficient waste collection and recycling system in the state.*
- ii. Adopt a stocks-based prediction model based on material flow analysis

- iii. Draw a value trade chain on local and national levels for E-waste. It de-scribes processes and activities carried out by the different stakeholders of the E-waste management chain in a geographical region.
- iv. Define and standardized the suitable equipments and facilities for the management and recycling of E-waste at the end of the products' useful life consistent and complimentary to that of national standards.
- v. Provide accreditation of treatment facilities for WEEE
- vi. Assess and reduced environmental contamination from e waste and remediate where there are hotspots. Assessments of human health impacts from oral intake, inhalation, and dermal contact will need to be subsequently investigated in areas of hot spots.
- vii. Adopt the Extended Producer Responsibility (EPR) programme in the management of its e waste. An EPR programme would represent a suitable candidate policy for managing E-waste in Lagos State. Its many advantages include waste prevention and reduction, product reuse, increased use of recycled materials in production, reduced natural resource consumption, internalization of environmental costs in product prices, and energy recovery when incineration is considered appropriate.
- viii. Allocate funds to the State Environmental Protection Agency to strictly supervise E-waste collection, storage, and recycling and/or disposal, and the Trade and Industry Ministries to have more control over the Procurement, import and Production of electronic goods in the State.
- ix. Develop a legal framework to back up the effective management of e waste in addition or in cooperation with existing national regulation of e waste. There is urgent need for the implementation of legislation dealing specifically with E-waste, the implementation of EPR programme and allocation of funds to prepare suitable equipment and facilities for the managing and recycling of e waste in Lagos State.

#### 3.2.4. MANAGEMENT OF HAZARDOUS WASTES FROM WEEE PROCESSING

Management of hazardous wastes from WEEE processing can be ensured through the incorporation and implementation of the six core elements of the ISO 14000 environmental Management Systems requirements.

##### **EMS Core Performance Element (CPE) -1**

**The WEEE processing facilities shall have an applicable Environmental Management System (EMS) in place.**

As an underlying principle of ESM, waste management facilities should have an applicable environmental management system (EMS) in place.

### **Policy statements**

The State shall ensure that:

- i. A fully developed EMS certified by the E waste Unit/ department is in place and should include:
  - o Measurable objectives for continual improvements in environmental performance, including periodic review of the continuing relevance of these objectives;
  - o Regular monitoring and re-examination of progress toward environmental, health and safety objectives;
  - o Collection and evaluation of adequate and timely environmental, health and safety information regarding facility activities;
  - o Applicable ESM technical guidance.
- ii. All waste management facilities shall be Licensed/authorized / permitted and subject to periodic inspections and/or audits, normally on an annual basis, by an accredited independent auditor. The auditor shall:
  - o verify the conformance of the facility with CPEs 2 to 6, relevant environmental regulations, and, if applicable, current EMS systems, such as the ISO 14001 Environmental Management or any other equivalent national or sub-national system;
  - o assess the performance of the facility regarding environmental, health and safety aspects against measurable objectives.
- iii. The procedures for achieving certification/registration and reporting concerning SMEs shall be simplified in comparison with large facilities. Because regular audits may create a burden and impose excessive costs on SMEs, their audits should be less complicated and could be carried out less frequently (normally every three years) than those of large facilities, while being consistent with the need to maintain an ESM of waste.
- iv. The Environment, Health and Safety report on the waste sector shall be made publicly available every three years. In addition, domestic EMS systems which are specifically tailored to address the needs of SMEs in the waste sector should be developed in collaboration with the SMEs.
- v. The government or large companies have a programme in place to provide support for SMEs in terms of information and know-how sharing concerning whatever EMS system will be selected.

### **EMS Core Performance Element CPE-2**

**The WEEE processing facilities shall take sufficient measures to safeguard Occupational and Environmental Health and Safety.**

### **Policy Statements**

### **The State shall ensure**

- i. Workers of WEEE processing facilities shall not be exposed to unacceptable occupational health and accident risks, related to the content of the materials they are handling, or from emissions from those materials and the equipment being used. *(The waste may include hazardous chemicals or toxic metals; they may emit toxic gases or release harmful dust. Workers may have to handle heavy loads, be exposed to vibration and noise of machinery. Also, the risk of fire, explosion, etc. may exist in some cases). Consequently, adequate measures should be taken to avoid unacceptable occupational health and safety risks.*
- ii. People living and working in the vicinity of a waste management facility shall also not be exposed to unacceptable environmental health and accident risks. *These risks relate mainly to the emissions, including noise, from the process and transport to and from the facility.*
- iii. Adequate measures which may include national as well as international regulations, agreements, principles and standards, whether mandatory or voluntary are taken to minimise these impacts to human health.

### **EMS Core Performance Element CPE-3**

**The facility should have an adequate Monitoring, Recording and Reporting Programme.**

#### **Policy Statements**

The State shall ensure

- i. All WEEE Processing facility have a monitoring and recording programme which covers:
  - relevant legal requirements, including key process parameters;
  - compliance with applicable safety requirements;
  - effluents and emissions; and
  - incoming, stored and outgoing waste, in particular hazardous waste.
- ii. All relevant environmental records are maintained and made available to competent authorities according to national / State legislation and/or local authorisation/license/permit requirements. Waste management facilities should maintain records on the generation, collection, recovery or disposal of waste, its types and amounts which are to be made available to the competent authorities upon request.
- iii. On-site recovery or disposal of waste generated by the process concerned must be carried out in compliance with applicable laws and regulations and shall be recorded appropriately. In case of off-site recovery or disposal, outgoing waste should be recorded appropriately and handed over only to environmentally sound recovery and/or disposal operations.
- iv. Upon request, and taking into account business confidentiality and the protection of intellectual property rights, reliable information on the activities of

the facility that may impact the environment or the health and safety of personnel shall be made available to the public in a reliable and timely manner.

#### **EMS Core Performance Element CPE-4**

**The WEEE processing facility shall have an appropriate and adequate Training Programme for the personnel.**

#### **Policy Statements**

##### **The State shall ensure that**

- i. The WEEE processing facilities shall have training in place for proper identification and handling of any hazardous components in incoming waste.
- ii. Personnel involved in the management of waste and materials, in particular hazardous waste and materials, shall be capable and adequately trained to be able to properly handle the materials, equipment and processes, eliminate risk situations, control releases and carry out safety and emergency procedures.
- iii. The WEEE processing facilities shall define and document the responsibility, authority and interrelations of key personnel who manage, perform and monitor the activities which may have adverse effects on the environment.
- iv. Adequate operative training programme for the personnel shall be in place and properly documented.

#### **EMS Core Performance Element CPE-5**

**The facility should have an adequate Emergency Plan.**

#### **Policy Statements**

##### **The State shall ensure that:**

- i. The WEEE processing facility shall have a regularly updated plan for monitoring, reporting and responding to accidental or otherwise exceptional pollutant releases, including emergencies such as accidents, fires, explosion, abnormal operating conditions etc.
- ii. The emergency plan is based on the evaluation of existing and potential risks.
- iii. An emergency co-ordinator is designated in each facility to handle hazardous wastes.
- iv. Large WEEE Processing facilities prepare and provide a complete contingency plan. The plan should cover both short-term and long-term remedial activities.
- v. SMEs whose operation presents little or no risk shall provide a significantly more limited emergency plan.
- vi. The emergency plan (s) shall be periodically reviewed by the relevant authority and/or external auditor. Particularly, in case of SMEs the reviewing body could be the local fire fighting agency or in conjunction with the Lagos State Environmental Protection Agency (LASEPA) as appropriate.
- vii. The emergency plan is regularly tested and revised as appropriate, in particular after the occurrence of accidents or emergency situations.

## **EMS Core Performance Element CPE-6**

**The facility should have an adequate plan for closure and after-care.**

### **Policy Statement**

**The State shall ensure that:**

- i. All WEEE processing facility operating in the State shall prepare and submit an adequate plan for closure and after-care from inception of its operation. The need for closure plans and financial guarantees is determined by applicable laws and regulations, taking into consideration the level of risk.
- ii. Closure plans are updated periodically on the basis of determined level of risks and financial guarantees should ensure that the necessary measures are undertaken upon definite cessation of activities to prevent any environmental damage and return the site of operation to a satisfactory state, as required by applicable laws and regulations. [Note – an after-care plan is not necessary for every recycling company, hence evaluation needs to be made on case by case.]

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### **3.3. PRODUCERS TAKE BACK OF E WASTE**

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One of the most frequently recommended E-waste management policies is the extended producer responsibility (EPR) programme. The Organization for Economic Cooperation and Development (OECD) defined EPR as ‘an environmental policy approach in which a producers’ responsibility for a product is extended to the post-consumer stage of a products life cycle including its final disposal’.

In addition, EPR is defined as a strategy that makes the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take back, recycling and final disposal of the product.

The main goals of EPR are: (1) source reduction (natural resource conservation/materials conservation); (2) waste prevention and reduction; (3) design of more environmentally compatible products; (4) closure of material loops to promote sustainable development; (5) product reuse; (6) increased use of recycled materials in production; (7) internalization of environmental costs into product prices; and (8) energy recovery when incineration is considered appropriate).

EPR can be implemented through administrative, economics and informative instruments. Therefore, EPR policy instruments can include different types of product fees and taxes, such as advance recycling fees (ARFs), product take-back mandates, virgin material taxes, and even combinations of these instruments.

The range of instrumental approaches for implementing EPR includes mandated product take-back, voluntary product take back, and particular economic instruments in accord with other countries' experiences.

Mandated product take-back for Lagos State is recommended. With this policy approach, the government mandates that manufacturers, importers and/or retailers take back products at the end of the products' useful life.

To prepare for the costs of recycling or disposal of electronic and electrical equipment at the end of the life of the items (EoL) in the proposed EPR programme, the advance recycling fee (ARF) as economic instruments can be implemented. Moreover, to encourage the consumer to take back the product at the end of the product's useful life, a proportion of the ARF (for example, 50%) can be refunded.

Initially, it is better to begin work with some categories of electronic or electrical equipment that are used more and that involve high amounts of waste. Examples include TVs and PCs among brown goods and refrigerators and washing machines among white goods. The programme can then be extended to cover other equipment.

The State EPR implementation shall be premised upon the dominant condition observed or assessed through the value trade chain on local and national levels for E-waste. The differences manifest themselves in, among other things, scope (e.g. all EEE vs. large home appliances), range and type of producer responsibility (e.g. collective responsibility vs. individual responsibility), and funding mechanism (i.e. who pays how much, at which points).

The state shall develop regulations on Extended Producers Responsibility with mandatory producer take back of e - waste and performance obligations as the ultimate. A take back system has three main functions namely, Collection, Processing/ Treatment and System Management.

### 3.3.1 GUIDING PRINCIPLES FOR AN EFFECTIVE EPR PROGRAM

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- EPR regulations and programmes should be designed to **provide producers with incentives** to incorporate changes upstream at the design phase or procurement phase - where producers are importers as relevant in Nigeria context in order to be more environmentally sound.
- Regulations and programmes should stimulate **innovation** by focusing more on results than on the means of achieving them, thus allowing producers flexibility with regard to implementation. (e.g Fix the target of WEEE/E-waste inventory to be collected and transported across the state).
- Regulations and programmes should take a **life cycle approach** and be directed at producing life cycle benefits, even if they focus on the post-consumer phase, so that environmental impacts are not increased or transferred somewhere else in the product chain.

- Use EPR regulation and programmes as a means to emphasize waste minimization; Explore opportunities for energy recovery and Create incentives to facilitate recycling;
- Develop legislation that promotes recycling; with full consideration of health, environmental risks and legal implications
- **Responsibilities** should be well defined. They should not be diluted out of existence across all the actors in the product chain. There is need for clarity on who the 'Producer' is;
- Create a common understanding of the concept of EPR among stakeholders;
- Policies should be **product specific**. One type of programme or measure is not applicable to all products, product categories or waste streams.
- There is need to Ban certain waste streams from the landfill sites;
- Extension of producer responsibilities should take place in such a way as to increase **communication** among the actors in the entire product chain concerning the product's life cycle impacts.
- A **communication** strategy should be devised to inform all the actors in the product chain as well as consumers, about the programme and enlist their support and co-operation.
  - To enhance a programme's acceptability and effectiveness, **consultation of stakeholders** about its goals and objectives as well as estimates of its costs and benefits should be conducted.
  - **Local governments** should be consulted in order to clarify their role and obtain their advice concerning the programme's operation.
  - Both **voluntary and mandatory approaches** should be considered, with a view to meeting national and state environmental goals and objectives in the best way possible.
  - A **comprehensive analysis** of the EPR programme should be made. (e.g., which products, product categories and waste streams are appropriate for EPR, whether historical products should be included, and the roles of all actors in the product chain).
- EPR programmes should undergo periodic **evaluations** and be flexible enough to be adapted by government in response to these evaluations.
- Programmes should be designed and implemented in such a way that environmental benefits are obtained while domestic **economic dislocations** are avoided.
- International producers should be enforced by the authorities to apply international best practice when operating in Lagos State. When products or commodities are imported and being sold in the State an appropriate waste management levy or tax should be applied, and there should be strict monitoring of impacts of such product.
- The process of developing and implementing an EPR strategy, and putting it into operation, should be based on **transparency**.

- Stakeholders should agree on a **compliance** mechanism that best meets the programme's goals and objectives.
- Where there is a significant pollution impact, the polluter-pays principle should be applied
- EPR should be the joint responsibility of government, manufacturers, and end users.

### 3.3.2. PRODUCT TAKE BACK OBJECTIVE

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- To prevent waste and encourage waste minimization and waste recovery
- To increase collection and recycling rates of the products and materials targeted;
- To shift financial responsibility from Local and State Waste Management Authority to producers and thereby incentivise Design-for-Environment (DfE) activities and innovation.

### 3.3.3. PRODUCT TAKE BACK POLICY STATEMENTS

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The State shall:

- i. Develop regulations on Extended Producers Responsibility with mandatory producer take back of e - waste and performance obligations.
- ii. Reduce waste generation and disposal by 50% and 25% respectively by 2025 and develop a plan for zero waste by 2022.
- iii. Be committed to sustainable development through environmentally responsible product development, product recovery and product take back strategies.
- iv. Mandate the producer/ assembler/ distributor to be responsible for setting up collection centre's or take-back systems either individually or collectively. The decision about the mechanism for collection can be decided by the individual producer in accordance with their company policy.
- v. Encourage specialized sorting centres controlled by the collective system/ PRO or more commonly third party sites, whose operators may be remunerated for the provision of space.
- vi. Encourage Private Public Partnerships (PPP) which could include environmental consultants or NGOs to be given the responsibility of managing the take back schemes, they will provide the management and administration of e-waste collected.
- vii. Institutionalize the establishment of collection centre to collect the E-waste individually or jointly through a registered society or a designated agency or a company or an association,
- viii. Adopt Appropriate measures to minimize the disposal of WEEE/ e-waste as unsorted municipal waste and to achieve a high level of separate collection of WEEE/ E-waste
- ix. Ensure availability and accessibility of the necessary collection facilities taking into account in particular the population density.

- x. Optimizes collection and transport of separately collected WEEE/ E-waste towards reuse and recycling of those components or whole appliances capable of being reused or recycled.
- xi. Ensure that a rate of separate collection of at least four kilograms on average per inhabitant per year of WEEE/ E-waste from private household is achieved within the 5<sup>th</sup> year of this policy and legislation coming to force.
- xii. Ensure Producers of EEE are responsible for final disposal of the products that becomes WEEE.
- xiii. Ensure Private households do not dispose of WEEE/ E-waste as unsorted municipal waste and to collect such WEEE/ E-waste separately.
- xiv. Ensure installation of Collection Bins specifically for E- waste in public places such as restaurants, malls, offices etc, which can be owned by the authorized collection centres or the producer.
- xv. Ensure the contact details of authorized collection agencies should be printed on these bins for reference purposes of the general public.
- xvi. Encourage each commercial, residential, industrial, governmental, educational facility to identify a place/ area as E-waste collection point in their premises.
- xvii. Initiate public awareness campaign to collect E- waste at authorized collection facility and only give to authorized recycler for treatment and disposal.
- xviii. Put into place a compliance monitoring system to monitor release of pollutants to the environment and occupational public health risk from uncontrolled treatment of WEEE/E-waste in unorganized/ informal sector.
- xix. Be responsible for coordinating the actions of various stakeholders and enforcing the system rules and regulations.
- xx. Be responsible for standardising form for collection, reimbursing collectors and processors, setting and enforcing treatment standards, enforcing sales bans on Producers/ Assemblers and importers, who do not comply with take-back system laws and approving processors (recyclers, dismantlers and refurbishers) and collectors to take part in the system.
- xxi. Prioritize in hierarchy the approaches to treat WEEE/ E-waste from the concentration of these hazardous chemicals and elements through decontamination/ dismantling, recycling and recovery of items of economic value and finally dispose WEEE/ E-waste fractions through either incineration or landfilling or a combination of both.
- xxii. Be responsible for licensing the WEEE/ E-waste Processing /treatment options which may include the following unit operations:
  - Decontamination/ Dismantling
  - Segregation of ferrous metal, non-ferrous metal and plastic
  - Recycling/recovery of valuable materials
  - Treatment/disposal of dangerous materials and waste
  - Landfilling, incineration or disposal of in underground storages,

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### 3.3.4 E-WASTE STAKEHOLDERS IN LAGOS STATE

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- ✚ Retailers of Electrical appliances
- ✚ Manufacturers /Assemblers of Electrical appliances
- ✚ Consumers and Bulk consumers (e.g- Alton, Banks,etc)
- ✚ Importers of electrical appliances
- ✚ Informal collectors
- ✚ Formal Collectors and Recyclers
- ✚ NGOs
- ✚ Governmental agencies (MDAs)

In order to have an effective Public Private Partnership (PPP) model, the different stakeholders need to have a clear right and responsibility in the life cycle of E-waste.

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### 3.3.5. RIGHTS AND RESPONSIBILITIES OF STAKE HOLDERS

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#### 3.3.5.1. RESPONSIBILITY OF PRODUCERS/ ASSEMBLERS

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The Producers/ Assemblers of electrical and electronic equipment must be responsible for;

##### 1. Collection of e-waste generated;

- During the manufacture of electrical and electronic equipment and channelizing it for recycling or disposal.
- From the end of life of their products in line with the principle of extended producer responsibility and to ensure that such e -wastes are channeled to registered dismantlers or recyclers. Producers/ Assemblers shall as necessary ensure collection and channelization by authorizing collection agencies.

- 1 Setting up collection centers or take back systems either individually or collectively. In this collection mechanism, WEEE/ E-waste is taken back directly by producers either directly at their facilities or designing collection centre's and then fed into the WEEE/ E-waste system. This usually applies to larger commercial equipment and operates on the principle of "new equipment replacing the old ones".

Producers/ Assemblers may fund a collection centre run by NGOs who are committed to e-waste or run a collection centre by themselves or franchise it to others or support licensed/ accredited private operators. The collection centre should be in every local government in Lagos state and in a place where all electronics is accepted, (working or broken); it will be in a central or easily accessible location where people can drop off their old electronics six days a week free of charge. Residential pick-ups can also be done in collaboration with the

Lagos state waste management authority through Private Sector Participation (PSP) for a small fee.

- 2 Financing and organizing a system to meet the cost involved in the environmentally sound management of e-waste generated from the end of life of its own product and historical waste available on the date from which the E- waste policy come into force. The financing arrangement of such a system shall be transparent. The producer may choose to establish such a system either individually or by joining a collective scheme.
- 3 Producers are responsible for the costs of picking up WEEE/E-waste from collection facilities and for refurbishing waste products for reuse or for recycling and recovery
- 4 Providing contact details such as address, telephone numbers, and number of authorized collection centers to bulk consumers or consumers in order to facilitate return of used electrical or electronic equipments.
- 5 Ensuring eco-efficiency perspective is introduced into the design of their products, such that the products design is focused on avoiding specific recycling “accidents” at end of life of products.
- 6 Creating awareness through publications, advertisements, posters, annual campaigns, events or by any other means of communication and information booklets accompanying the equipment, with regard to; Information on disposal such as affixing a visible, legible and indelible symbol given below in fig 2.1 on the products or information booklet to prevent e-waste from being dropped in garbage bins containing waste destined for disposal.



**Figure 3.2 Symbol to be affixed on Electrical and Electronic Goods.**

As listed above, their responsibilities are divided into three;

**Financially:** Whatever financing mechanism is applied for the collection categories with Net costs, the financial mechanism itself should not promote doing anything less than stated in the responsibilities outlined above.

**Organizationally:** Producers/ Assemblers are the only stakeholders with global organizing capabilities for the e products and waste.

**Product design:**

All design-for-recycling motivated product design changes should be evaluated from a life-cycle perspective to ensure that end-of-life considerations are balanced with other eco-design principles. This can be carried out by adapting the following;

- ✚ Adopting product specific approach.
- ✚ Assessment of end of life disposal in design phase
- ✚ Strengthen reverse logistics.
- ✚ Embrace extended producer responsibility (EPR) and product stewardship.
- ✚ Strengthening take back programs.
- ✚ Alignment of Marketing Strategies.
- ✚ Market recycled products.
- ✚ Increase vendor and customer awareness.
- ✚ Promote discounts for customer returns.
- ✚ Increased marketing of green raw materials and green production processes.
- ✚ Set waste recovery targets.
- ✚ Provide permanent collection infrastructure.
- ✚ Remanufacture and reuse - Work with recyclers.
- ✚ Disclose source of minerals in products.
- ✚ Adopt proactive and not reactive stance to sustainable supply chain.
- ✚ Provide design for disassembly to public.
- ✚ Use recycled materials where possible.

#### 3.3.5.2. RESPONSIBILITIES OF COLLECTION CENTRES

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Collection centres should do the following;

1. Provide detail address, telephone numbers, e-mail to the general public.
  2. Ensure that the e-waste collected by them is stored in a secured manner till it is sent to registered dismantlers or recyclers.
  3. Ensure that no damage is caused to the environment as a result of storage and transportation of e-waste.
  4. Area of the collection point/ storage should be able to accommodate separated/sorted WEEE/ E-waste with respect to size.
  5. Collection point/ storage area should have impermeable surface with sealed drainage system. Sites for storage (including temporary storage) of WEEE/E-waste prior to their treatment should have impermeable surface for appropriate areas with the provision of spillage collection facilities and where appropriate, decanters and cleanser-degreasers.
  6. Sites for storage (including temporary storage) of WEEE/E-waste prior to their treatment should have weatherproof covering for appropriate areas.
  7. Keep records of E-waste handled and make sure records are available for scrutiny by the government agencies.
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### 3.3.5.3. RESPONSIBILITIES OF CONSUMERS OR BULK CONSUMER

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Bulk consumers of electrical and electronic equipment should ensure that:

- e-waste generated by them is channelled to authorised collection centres or registered dismantlers or recyclers or is returned to the pick up or take back services provided by the Producers/ Assemblers; and
- Shall maintain records of e-waste generated by them and make such records available for scrutiny by the environmental government agency.

### 3.3.5.4. RESPONSIBILITIES OF RETAILERS

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1. Retailers are expected to maximize collection by providing more service to consumers with more easily accessible collection points and a direct fulfilment of producer obligations for their own-branded products.
2. An “all-for-all” take-back mechanism should be considered: selling a product category means take-back of any type of equipment, free of charge with an obligation to forward collected waste to collection points or Producers/ Assemblers.
3. In this collection mechanism, consumers can take back WEEE/ E-waste to retail stores that distribute similar products. They may give back the product at the retail store depending upon purchase of a new product, or without any purchase required, and is sometimes done at the point of home delivery and installation of a new item by the retailer/distributor. Where available, this service is usually free to private households. This can be effected over a period of time.
4. Retailers should also record the quantity of e-waste sold and should make it available to government inspectors for scrutiny.
5. Ensure that imported used electrical and Electronic Equipment (UEEE) or its dismantled parts imported are registered with NESREA and State Environmental Protection Agency (LASEPA) as appropriate for ease of compliance monitoring.

### 3.3.5.5. RESPONSIBILITIES OF DISMANTLER AND RECYCLER

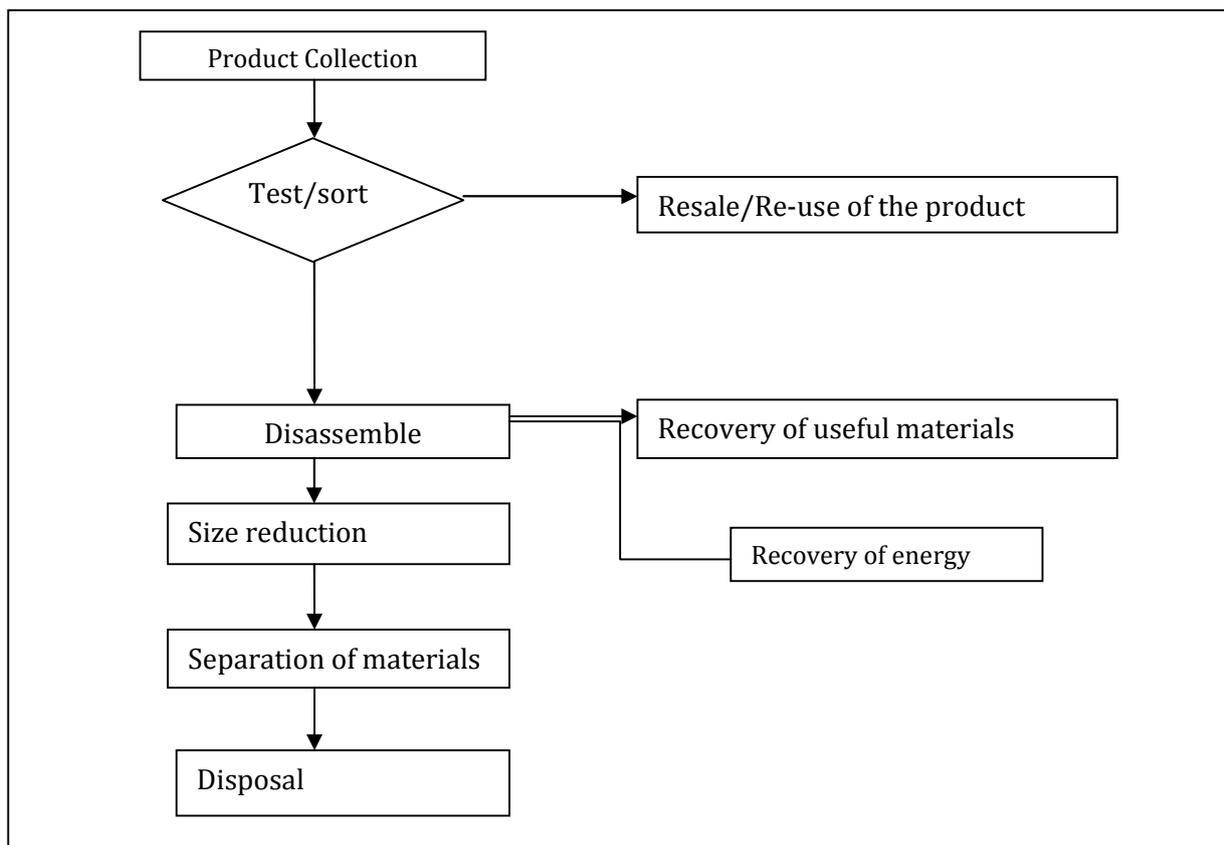
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- Every dismantler/ recycler should obtain authorization and registration from the environmental agency.
- Ensure that dismantling processes are in accordance to standard and guidelines set out by the environmental agencies.
- Ensure that the facility and recycling processes are in accordance with the standards laid down by the environmental agencies.
- Make available all records of recycled e-waste to the environmental agencies.
- Ensure that residue generated thereof is disposed off in hazardous waste storage and disposal facility.

- Ensure that dismantled parts to be exported are registered with National regulatory Agency in charge (NESREA).
- Ensure that imported used electrical and Electronic Equipment (UEEE) or its dismantled parts imported are registered with NESREA and State Environmental Protection Agency (LASEPA) as appropriate for ease of compliance monitoring.

### 3.3.5.6. RESPONSIBILITIES OF RECYCLERS

1. Recycler's should develop best available technologies and practices for the recycling sector particularly monitoring practices for outgoing material fractions.
2. Avoid illegal secondary trading with its associated adverse environmental effects by installing and complying with transparent substance flow monitoring and reporting.
3. Ensure that imported used electrical and Electronic Equipment (UEEE) or its dismantled parts imported are registered with NESREA and State Environmental Protection Agency (LASEPA) as appropriate for ease of compliance monitoring.



**Figure 3.3 Simplified Flowchart of E-waste Recycling Process.**

Recyclers should also do the following;

4. Follow sound End of life management.

5. Adhere to End of Life (EOL) regulations as provided by the producers/assemblers.
6. Works towards strengthening reverse logistics.
7. Creates jobs.
8. Creates awareness.
9. Works with industry for take back programs.
10. Improved E-waste Collection.
11. Support the infrastructure for collection of e -waste.
12. Adopting efficient recycling processes in their facility(ies)
13. Ensure recycling residues are disposed in an environmentally sound manner.
14. Invest in advanced sorting technology.
15. Invest in Improved technology for recovery.

#### 3.3.5.7. RESPONSIBILITES OF GOVERNMENT AGENCIES

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E-waste is a global and societal problem because of its long term environmental impact; its management system should be effectively regulated by policy mechanism. Therefore it will be the responsibility of:

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##### MINISTRY OF ENVIRONMENT

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- Develop a strategic life cycle management plan in conjunction with the Science and Technology Ministry on their responsibility of automation of government activities.
- Develop checklist in collaboration with the Lagos State Public Procurement Agency on electronic equipment towards meeting sustainable green procurement.
- Liaise with the ministry of Education to develop curricula on environmental sound management of waste in schools.
- Develop an all-encompassing strategic plan for implementing the E-waste policy, detailing the costs, time frames, targets, outputs and outcomes;

The key outcomes for Lagos State by 2025 are stated as follows:

1. Lagos State manages E- waste, including hazardous waste, in an environmentally safe, scientific and sound manner, and has reduced the amount per capita of waste disposed in Landfill by 50 % of baseline year (2015) statistics in 2025.

2. E- Waste streams are routinely managed as a resource to achieve better Environmental, Social and Economic outcomes, including saving water, energy, greenhouse gas emissions and finite resources, and to increase productivity of the land.
3. Establishment of self sustaining E - waste Processing Plants in Lagos State by year 2020 for separation and dismantling of e-waste including domestic appliances, ICT electronics and mobile phones.
4. Increased opportunities to safely manage, reduce and recycle E- waste are available to all lagosians, including approaches that have been tailored to meet the needs of the informal sector for proper collection, dismantling and recycling of e-waste with skills transfer and revenue generation from a baseline status of 2015.
5. The risks associated with E- waste and hazardous substances are understood and managed to minimize current and intergenerational legacy issues.
  - Lagos State manages its products, materials and chemicals that contain potentially hazardous substances, in particular those that are persistent, bio-accumulative and toxic, consistent with its national, international obligations and using best available evidence, techniques and technologies.
  - Local stockpiling of E - waste and hazardous waste has been significantly reduced, particularly in warehouses and on landfill sites by 50% in 2017 from the baseline year of 2015.
  - There are consistent and clear requirements for disposal of E- waste and hazardous material, and for content labelling of manufactured e- goods, that also provide a level playing field for Nigerian manufacturers/ assemblers , importers and inform the consumers.
6. In Lagos State, it' will be illegal by 2025 to send E –waste to the landfill by any organised private sector or government agency or private individual without a license.

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#### LAGOS STATE ENVIRONMENTAL AGENCY (LASEPA)

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The Lagos State Environmental Protection Agency (**LASEPA**) as an appropriate arm of the government should among its other responsibilities:

1. Set up a departmental in the LASEPA to manage the E – waste program.
2. Institute data bank on e waste streams from all governmental, commercial and industrial establishment and educational institutions
3. Carry out a baseline survey and analysis of the E-waste threat in the state and benchmark e- waste recovery in the state;
4. Create a form where information on collection, production, dismantling and recycling are documented by all necessary stakeholders.
5. Adopt sound end of life management technology in the life cycle of e waste stream;

6. Develop sustainable models for E-waste management;
7. Encourage set up of facilities to handle refurbishment of unwanted electrical and electronic equipment and/ or E-waste recycling across the state;
8. Reduce landfill collection of E- waste with collection and recovery targets on an annual basis;
9. Develop incentives for E- waste to be collected separately and in sorted categories;
10. Develop incentives for establishment of sustainable E-waste disposal facilities through mutually beneficial reuse and/or recycling schemes.
11. Provide job generation in the recycling sector by supportive policies;
12. Streamlining operations of scrap vendors by awareness and incorporation into government authorized vendor list;
13. Institute appropriate regulations meeting global standards for E-waste disposal and recovery;
14. Create or adopt national guidelines and standards for recycling and dismantling.
15. Review and amend the relevant State Laws and Acts to address E-waste management, including issues of procurement, manufacturer/distributor responsibility and end-of-life equipment take-back;
16. Regularly inspect all private and public collection centers, storage facilities and recycling centers to ensure compliance with guidelines and standards;

16.1. Management of safety and health risks arising from landfill gas emissions Including responsibility to meet international obligations on the reduction of dioxins and furans from open burning of e- waste and other waste municipal stream;

16.2. Providing incentives to reduce hazardous materials entering the waste stream;

16.3. Ensuring disposal of e-waste in an environmentally sound manner in appropriate facilities;

16.4. Audit of existing waste infrastructure and local capability in communities as part of essential services audit;

16.5. Minimize the generation of e-waste, reduce the amount of e-waste for disposal, manage e-waste as a resource and ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner; and Contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency, and the productivity of the land.

16.6. Encourage use of biodegradable packaging products and recharge cards, resource recovery of E waste and reduction of e- waste material sent to landfill.

17. Creating an avenue where there are authorized recycler through registration as green category industry thereby regulating refurbishing and re-use practice. There is no “one type” of Electronics Recycler or Electronics Recycling Facility. Registration of “Recyclers” includes, but need not be limited to:
    - Resellers
    - Asset recoverers
    - Refurbishers
    - The manufacturers /assemblers
    - Shredding facilities
    - CRT Glass Processors
    - Precious metals refining facilities
    - Plastic recyclers: mold plastic into new products
    - various combinations of the above types
  18. Publish a three yearly waste and resource recovery report, underpinned by a system that provides access to integrated state wide core data on waste and resource recovery;
    - 18.1. It is therefore important on a State wide basis to develop an annual generation data-set on the following used electronics starting with 2015 as the baseline year:
      - Generated (coming directly out of use or post-use storage destined for collection or disposal),
      - Collected (for recycling versus disposal),
      - Imported Used Electronics( destined for recovery or recycling in the E waste Plant in Lagos) ; and
      - Exported (as whole units versus dismantled units to neighbouring countries).
  19. Enforcing environmental sound management of lifecycle of all IT assets spanning from acquisition to disposal in corporate and governmental organisations. This includes :
    - 19.1. Preferential dealing with IT vendors having sound E-Waste management processes.
    - 19.2. Extending the useful life of IT assets to postpone / minimize generation of E-Waste
    - 19.3. Responsible disposal processes conforming to regulatory requirements and best practices
  20. Registration of scavengers on E- waste towards capacity building on technical support.
  21. Enforcement of e waste and other relevant regulations.
  22. Coordinate the management of the e -waste fund.
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## LAGOS STATE WASTE MANAGEMENT AUTHORITY (LAWMA)

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The Lagos State Waste Management Authority (**LAWMA**) will be responsible for:

1. Management of all waste streams which includes the collection, transportation, processing and eventual disposal of wastes.
2. Registration of e -waste PSP
3. Strategies for addressing and/ or offsetting emissions from open burning of E-waste for recovery that complement the approach to resource recovery and energy production
4. Educating people against burning of e-wastes on landfill sites.
5. Provision of engineered landfill sites for residual e- waste streams from recycling operations
6. Ensure e -waste are sorted and is not mixed with municipal waste
7. Ensure that e- waste landfill targets - the amount per capita of waste disposed in Landfill by 50 % of baseline year (2015) statistics in 2025 are complied with.

## 4.0. FUNDING MECHANISM INITIATIVES FOR THE E-WASTE PROGRAM

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Financing of downstream e-waste activities and allocation of economic responsibilities along the downstream chain can be challenging. For the sustainable implementation of the WEEE system in Lagos State, also the financial sustainability of the sector has to be assured to the extent possible.

### 5.1. FINANCIAL MECHANISM OBJECTIVES:

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The following paragraphs outline the most relevant general objectives and requirements to be met with the set up of the Financial Mechanism.

- **Coverage of Costs**  
For the sustainability of the Financial Mechanism it is important that all costs for the WEEE system shall be borne. The public sector in this respect only has to cover the administrative costs and the costs for the construction and operation of the municipal collection points (without containers). All other costs shall be borne by the private sector.
- **Legal requirements (in consonance with the National legal framework- National Environmental (Electrical/Electronics Sector) Regulations S.I. No. 23, adopted in 2011 and the Guidelines on Extended Producers Responsibilities adopted in 2014)**  
The implemented future Financial Mechanism of the State has to meet the legal requirements set by the National legal framework. This is due for the WEEE specific issues as well as the general accounting and legal standards etc.
- **Economic efficiency (fair cost sharing)**  
The cost sharing shall be to the extent possible efficient from the economic point of view, i.e. according to the producer pays principle each producer should participate in the costs according to the costs it's products generate.
- **Cost efficiency**  
The financial mechanism shall contribute to an efficient realisation of the services. For instance, a competitive environment as well as incentives for efficiency should be set in the financial mechanism.
- **Transparency**  
The structure of the financial should be realised in a reasonably transparent manner that allows the contributors (EEE producers) to verify that their payments are fair in comparison to other contributors. Furthermore, the EEE producers as well as the authorities shall have reasonable comfort on the agreed use of the funds collected by the contribution of the EEE producers, i.e. the visible fee charged to the consumers. However, this does not mean that the payments that shall be made be open to the public.

- **Administrative practicability**

A reasonable degree of administrative practicability shall assure that the Financial Mechanism is operative and the costs for administration shall in a reasonable proportion to the total costs of the services and the infrastructure. Furthermore, it shall be possible to update registers, costs, and quantities etc. without excessive administrative efforts.

- **Innovation friendly / Eco design**

The National WEEE regulation intended setting incentives to manufacturers, producers or assemblers to design and produce their product in a manner that they can be easily dismantled, recovered, reused, and materials recycled and as such supporting environmentally friendly product design. An innovative way to insure that producers are willing to invest in so-called Eco design is that they are able to recover the benefits of their investments. In reality, however, there is only an indirect linkage between fee levels for individual products or categories for recycling and the actual costs of the companies (as a result of cross subsidies between products groups of high administrative costs).

As a consequence, the individual company that invests in Eco design does not have the benefit of the result cost savings individually but the entire sector. Hence, from the point of view of the individual company there are only very limited benefits related to Eco design , hence the need to give encouraging support to the companies investing in environmentally friendly designs.

The outlined objectives often cannot be achieved to the maximum extent possible at once. For instance, the exact cost allocation according to the WEEE producers would require high efforts for the elaboration of statistics and the calculation of the WEEE costs for each product separately, which would be contra-productive to the administrative practicability. Hence, importance given to the specific objectives shall be balanced out taking into account the current situation of the WEEE sector in the State, the priorities set by the Lagos State authorities and other stakeholders.

## 5.2. FINANCIAL MECHANISM POLICY STATEMENTS

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The State shall:

- i. Engage in broad Consultation process with stakeholders to establish a funding initiative managed by the industry/ recyclers/ producers within a sound legislative framework.
- ii. Take into account existing practices of waste collection in the state to build systems that meet local specifics of culture, geography and industry.

- iii. Build at first WEEE/E-waste management systems, get the systems up and running before committing to performance and target setting measurement and monitor.
- iv. Assure the definition of a realistic overall target put into consideration, the quantity of the sold EEE in the past, the WEEE collected via the informal sector, and a realistic schedule for the implementation of a statewide collection system.
- v. Assess and determine acceptable and realistic figures for volumes, costs and standards without compromise of the desired environmental outcome.
- vi. Ensure there is clarity of the collection and financing of WEEE/ E-waste programme.
- vii. Establish efficient sorting and charging system based upon current market share model, either through fees on products sold, or allocation of actual costs to products placed on the market.
- viii. Identify the model to be followed and design the financing mechanism for take back system required, and it's phasing for implementation. *(The economic/ financial instrument may consist of different options. These options include actual costs of recycling, projected costs of recycling per category and cross subsidization).*
- ix. Make provision for the recognition of different financing needs of specific sectors. *(such as market share based or visible component based or by taxpayers e.g. financing the take back scheme and management of e-waste through the radio, television tax collected from tenements in the state or by the "Polluter Pays Principle", consumers will eventually pay the end-of-life costs as an increase of the product price (Advanced Recycling Fee (ARF)), even when no up-front external charges are paid at point of sale).*
- x. Ensure that when producers put a new product on the market, they must provide a financial "guarantee" that waste management of the product will be paid for. *(Producers can get waiver on this guarantee by participating in a producer responsibility organization (PRO), paying recycling insurance, or setting up a special bank account for this purpose).*
- xi. Make provisions for fines for non- compliance with the obligations under the WEEE legislation. *(Even though fines are actually not considered as a part of the Financial Mechanism, they imply financial consequences for the EEE producers in case of non-compliance with the obligations defined in the legislation. To be efficient the fines shall be significantly higher than the costs saved by non-compliance - opportunity costs).*

- xii. Develop action plan for implementation of WEEE/E-waste take back system consisting of starting from the base year, preparation period and implementation period.
- xiii. Decide the use of the choice of the economic instrument during preparation and implementation phase.
- xiv. Develop monitoring and auditing requirements for each category of stakeholder along the material flow chain. The auditing could be product audit, financial and accounting audit and collection and transportation audit.

## 5.0. IMPLEMENTATION AND RESOURCE MOBILISATION PLAN

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### 5.1. IMPLEMENTATION PLAN

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The implementation of the Policy will be the responsibility of the Ministry of Environment (MoE) of the Lagos State Government, working in close collaboration with other key line ministries. In that context, various implementation instruments will be developed to operationalise the Policy. These include a legislative framework and guidelines.

In addition, The Ministry of Environment shall work closely with relevant ministries and institutions in the execution of programmes, projects and activities emanating from the Policy. This will be achieved through strengthening and mobilising of capacities of existing relevant institutions and facilities in the State to address the e- waste opportunities and challenges.

### 5.2. INSTITUTIONAL ARRANGEMENTS

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In recognition of the threat posed by e waste and the uncoordinated manner in which informal activities and initiatives were being undertaken by various departments, institutions and organisations in the State, an e waste unit was created within the Lagos State Environmental Protection Agency in to oversee e waste activities. The E waste unit may be upgraded to a full department and may be tasked with the implementation of the Policy, but given the Policy's broad mandate, it (the Proposed E waste Department) will require a comprehensive building strategy to enhance its efficiency. The Proposed E waste Department's functions shall be to coordinate and manage the implementation of the Policy so as to enhance synergies and minimise duplication of efforts. It shall work jointly with existing relevant State and national governments' agencies, departments and institutions and others that may be established in the implementation of the Policy.

As a coordinating body, the upgraded E waste Department shall be vested *inter alia* with mandates to design E waste strategies and plans, design relevant projects, promote the introduction of environmentally sound management of waste in education curriculum, and initiate relevant capacity building projects on e waste.

### 5.3. PARTNERSHIPS AND COLLABORATIONS

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Collaborative action over and above State-level efforts and initiatives will be fast-tracked to ensure that the Lagos State E waste Policy is implemented. Partnership with various stakeholders including intergovernmental bodies, development partners, non-governmental organisations (NGOs), private sector, and civil society organisations (CSOs) shall be established. The special role often played by civil society organisations in e waste awareness, the importance of the private sector in e waste market development and finance as well as the role of development partners including multi-lateral finance institutions in provision of project finance are critical areas that the State will make every effort to tap into.

## POLICY STATEMENTS

The State shall:

- i. Develop instruments to implement the Policy including Lagos State e waste Strategy and Action Plan;
- ii. Establish and strengthen institutional framework, guided by both State and national laws and regulations, for the coordination and implementation of the the Lagos State e waste Policy, Lagos State e waste Strategy and Action Plan as would be developed; and
- iii. Establish partnerships with national, regional and international institutions and centres of excellence for sharing of information and knowledge on environmentally sound management of e waste, including best practices.

### 5.4. RESOURCE MOBILISATION PLAN

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#### 5.4.1. FINANCE

Financial resources to implement the Policy are one of the key elements in its implementation. Substantial and adequate funds will be required to support initiatives and programmes such as capacity building, training, education, awareness, research and development and others. Sustainable funding shall be mobilised from development partners including multilateral agencies, bilateral partners, and intergovernmental agencies and the private sector.

The State will also provide supplementary resources, and will put in place necessary measures and procedures in line with extended producers responsibility financing. Appropriate financial mechanisms shall be established to ensure availability of new, adequate, predictable and sustainable financial resources through:

- i. Provision of budgetary allocation to the initiatives targeted at reducing e-waste risks.
- ii. Set up of an e-waste fund that will be collected from both the sellers and buyers of electronic equipment applying the Advanced Recycling Fee (ARF) that requires consumers to pay a recycling fee when purchasing electrical /electronic equipments. The fee is collected in a E -waste fund to cover costs of collection and recycling of e-waste once the equipment reaches end of life
- iii. Put in place mechanism for resource mobilization from development partners. E-waste management is an issue of a global concern; therefore, resources will also be mobilized from development partners who offer support to developing countries in terms of undertaking baseline surveys, development of e-waste management action plans as well as carrying awareness amongst the population.
- iv. Streamlining bureaucratic procedures for accessing funds; and
- v. Reducing transaction costs for project implementation.

There will be need to develop effective systems to ensure transparency and accountability in the utilisation of funds mobilised for e waste.

### **Policy Statements:**

The State shall:

- i. Mobilise financial resources from various sources including from the international community and State resources to implement e waste programmes;
- ii. Set up and develop modalities for accessing domestic funds including the State E waste Fund once it becomes operational; and
- iii. Develop mechanisms to operationalise the Extended Producers Responsibility.

#### **5.4.2. CAPACITY BUILDING**

Capacity building for e waste programme shall focus on but not limited to the following areas and take into account the specific needs of electronic and electrical sectors:

- i. Education, training and public awareness;
- ii. Technology development and transfer;
- iii. Institutional strengthening and development including governance arrangements;
- iv. Information sharing, communication and knowledge management;
- v. E waste fund and finance; and
- vi. Partnership building and networking.

### **Policy Statements**

The State shall:

- i. Mainstream E-waste issues at all levels in the State education curriculum.
- ii. Ensure Development of training curricula for trainers
- iii. Promote introduction assimilation of responsible e-waste management culture into education and learning curricula;
- iv. Promote Information on hazards of improper handling, accidental breakage, damage and/or improper recycling of EEE
- v. Promote Instructions for handling the equipment after its use, along with the Do's and Don'ts
- vi. Promoting acquisition of EEE products with energy efficiency measures.
- vii. Support Cultivation and empowerment of responsible e- waste management ambassadorship programs amongst various segments of e-waste interest groups;

- viii. Promote development of tools, methods and technologies for E waste dismantling, recycling , treatment and final disposal
- ix. Promote disclosure of Information on hazardous constituents in electrical and electronic equipment
- x. Establish centers of excellence for training the requisite human resource on E waste dismantling, & recovery;
- xi. Embark upon capacity building and certification scheme on WEEE for all sectors in the state.
- xii. Develop and popularize a change management programme for leaders in Government and private sector institutions to embrace proper E-waste management;
- xiii. Ensure procurement of environmentally friendly electrical and electronic equipment across the state;
- xiv. Develop and implement an awareness campaign strategy to create general vigilance about the issues of E-waste management and ensure that the population understands how to safely dispose of E-waste and access safe disposal systems;
- xv. Increase of awareness at all levels and public participation on WEEE/E-wastes issues.
- xvi. Promote electronics reuse or the replacement of products by services (e.g. renting, sharing, refurbishment and recycling schemes etc), to lessen the waste load, in the first place.
- xvii. Promote training of customs and enforcement officers to control or verify export or import of electrical and electronic wastes and work on the identification of electronic wastes in the Harmonized System of the World Customs Organization
- xviii. Encourage and strengthen participatory and integrated approaches in planning and decision making including meaningful participation of all stakeholders including the civil society and community groups.
- xix. Institutionalize the public awareness and consultation programme through a biennial summit on e waste management and trends.

#### 5.5. MONITORING, EVALUATION AND REVIEW

A monitoring and evaluation (M&E) framework shall be developed as an integral component of the Policy implementation to ensure Policy goal and objectives are achieved and priority actions are implemented in a cost-effective, coordinated and harmonised approach. The upgraded E waste Department of the Lagos State Environmental Protection Agency will develop tools and guidelines for monitoring and evaluating the implementation of the Policy.

A monitoring and evaluation framework shall be developed to ensure midterm review of the policy. The policy shall be reviewed every three (3) years to take into account rapid changes in technology. Annual surveys shall be carried out to gather statistics about E-waste and its management with a view to establishing whether implementation

of the policy is making a positive impact on protection of the environment and life in general.

## DEFINITIONS

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1. **Authorization** means permission for handling collection, reception, storage, transportation, dismantling, recycling, treatment and disposal of e-waste.
2. **Advanced Recovery Fee (ARF):** A fee paid by a customer when he or she buys an electronic product. Once the consumer has used up the product and/or no longer wants it, he or she will take the product back to the retailer or manufacturer who will then use the ARF in order to dispose of the electronic product.
3. **Bulk consumer** means bulk users of electrical and electronic equipment such as central or state government, public sector, banks, educational institutions, multinational organization and private companies.
4. **Cathode ray tube (CRT):** Devices used to create images in the form of light on a screen. Old televisions and monitors were made using this technology, which contains a vacuum tube, electron gun, and a fluorescent screen. CRTs are environmentally hazardous because they contain large amounts of lead, which is hazardous to the environment.
5. **Collection centers** means a centre established individually or jointly or a registered society or a designated agency or a company or an association to collect e-waste.
6. A consumer means any person using electrical and electronic equipments excluding the bulk consumers.
7. **Dismantler's** means any person or registered society or a designated agency or a company or association engaged in dismantling of used electrical and electronic equipments into their components.
8. **Disposal** means any operation which does not lead to recycling, recovery or re-use and includes physical/chemical or biological treatment, incineration and deposition in landfill.
9. **Environmentally sound management** of e-waste means taking all steps required to ensure that e-waste are managed in a manner which shall protect health and environment against any adverse effect, which may result from hazardous substance contained in such wastes.
10. **Electrical and electronic equipment** means equipment which is dependent on electric currents or electromagnetic fields.
11. **Electronic waste or e-waste:** is a term for electronic products that have become unwanted, non-working or obsolete, and have essentially reached the end of their useful life.
12. **End of Life (EOL):** When a product is at its EOL, it can no longer be used for any purpose and should go to materials recovery.
13. **End of Use (EOU):** This is when a product is no longer being used for the purpose for which it was purchased, but is still useful in some way.

14. **Extended producer responsibility** means responsibility of any producer of electrical or electronic equipment for their products beyond manufacturing until environmentally sound management of their end of life products.
15. **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.
16. **Producer:** is any person who, irrespective of the selling technique used, “manufactures and offers to sell electrical and electronic equipment under his own brand; or offers to sell under his own brand, assembled electrical and electronic equipment produced by other manufacturers or suppliers; or offers to sell imported electrical and electronic equipment” and has to take authorization under this policy for implementation of EPR.
17. **Recycler:** is any person who is engaged in recycling or reprocessing of used electrical and electronic equipment or assemblies or their component. Recycling facility may be set up by an individual or a company or a joint venture or a consortium.
18. **Informal processing/Informal recycling:** Informal processing and recycling of electronics occurs when computers and other electronics are taken apart by individuals who do not use proper health and safety precautions and therefore place themselves as well as their surrounding environment in danger through exposure to unsafe materials and chemicals (acids, mercury, lead, toxic fumes, etc.). The toxicities of materials within an electronic product are not the only hazards with informal recycling. The acids used to extract materials, toxic or non-toxic can often have the greatest environmental impact.
19. **Used Electronics:** Refers to electronics at the end of use by their owner. May be reused by a friend, family member, or direct resale to another person not destined for collection or disposal.
20. **Generated Used Electronics:** Refers to used electronics coming directly out of use (retired) or post-use storage destined for collection or disposal (landfill or incineration).
21. **Collected Used Electronics:** Refers to used electronics collected by a firm or organization. May be destined for refurbishment or repair or may be obsolete, broken, or irreparable electronic devices destined for recycling via dismantling or shredding.
22. **Exported Used Electronics:** Collected used electronics that have been exported as whole units.
23. **Whole Units of Used Electronics:** Refers to intact used electronics that may or may not be working. This excludes disassembled products that may be exported as several different commodity material or product streams. In the case of CRTs, the term “whole units” is extended to include intact CRT tubes, but not CRT glass cullet. This is done because the CRT tube can function as a whole unit with the simple addition of a new plastic case.

24. **Visible Fee:** that is a fee charged in addition to the EEE product price for covering the costs of historical and orphan waste. The costs for historical and orphan waste shall be born between the EEE producers according to their market shares, i.e. proportional to their sales at present. Visible fee means that the retailers charge a fee to the consumers and show it as a distinct component of the price.
25. **Financial guarantee:** Is required in case of the registration of EEE producers for covering future WEEE costs, i.e. for the management of waste EEEs that were sold after January 1<sup>st</sup> 2015 (when National WEEE regulations and guidelines on Extended producers responsibility came into force). This requirement for providing a financial guarantee can be met by the following three alternatives: Joining a Collective Organisation, Providing a Blocked Bank Account /Bank bond, Providing a Recycling Insurance.
- 26.
27. **TVs:** Televisions, including CRT and Flat Panel TVs, including Rear-projection television (RPTV).
28. **Mobile Phones:** Including feature phones and smartphones, for the purposes of business, public and private use. Older mobile phones for motor vehicles are excluded.
29. **Desktop Computers:** Desktop computer, server and other process unit. Associated monitors are considered separately.
30. **Laptop Computers:** Portable personal computer, excluding tablets.
31. **CRT Monitors:** Cathode Ray Tube Monitors, works in conjunction with computers.
32. **Flat Panel Monitors:** Non-CRT monitors including Liquid-Crystal Display (LCD) and Light-Emitting Diode (LED) display. These monitors are mainly for computers, video monitors for surveillance are very similar and thus included.
33. **Residential** Electronics for personal use in the home
34. **Business/Public** Electronics for use in commercial, institution and education sectors.

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