



# **MINISTRY OF ENVIRONMENT AND FORESTRY**

## **NATIONAL E-WASTE MANAGEMENT STRATEGY**

**\*\*\*\*REVISED DRAFT\*\*\*\***

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## Foreword

In the recent past, the Information and Communication Technology (ICT) sector has been experiencing exponential growth. This has led to proliferation of Electrical and Electronic Equipment (EEE) due to rapid technological innovations, changing consumer preferences and decreasing costs. This has contributed to faster generation of E-waste. However, the increasing volumes of E-waste have not been matched with measures to ensure safe and sustainable E-waste management.

The various concerns from the sector and other stakeholders (including Government) has informed the decision of the Ministry of Environment and Forestry to develop a national E-waste strategy. This strategy provides a framework to guide stakeholders in the concerted efforts in sustainable management of E-waste in the country and hence build synergy among the various players. The strategy will also help to streamline the activities and their implementation by various actors towards realization of Vision 2030's sustainable waste management.

The government will offer the necessary support for the successful implementation of this strategy. I urge our development partners and stakeholders to play an active role in the implementation of this strategy.

**KERIAKO TOBIKO**

**CABINET SECRETARY**

**MINISTRY OF ENVIRONMENT AND FORESTRY**

## Preface

The increased use of electrical equipment's has brought about many challenges ranging from increasing stock piles of E-waste in the country to environmental and health problems associated with E-waste. In recognition of these challenges and opportunities posed by E-waste, the Ministry of Environment and Forestry will continue to put in place measures to ensure a clean, healthy and safe environment.

The development of the National E-waste Strategy marks another milestone by the government towards addressing the challenges and opportunities arising from E-waste. This steers the country towards a nationwide action aimed at mitigating the effects of E-waste

The National E-waste strategy takes into consideration the associated negative impacts and aims at ensuring a smooth transition to a zero-waste status. This is expected to be achieved through a sustainable E-waste management system in the country as envisaged in the goals and vision of this strategy.

This Strategy aims at addressing E-waste management through among other mechanisms: putting in place appropriate policies, laws, regulations, guidelines and standards; and conducting surveys on E-waste generation and volumes to inform priority E-waste management infrastructure in the country. It shall also put in place appropriate mechanisms for collection, transportation and disposal and also facilitate the development of a modern dismantling and recovery facility within the six economic zones in the country. County Governments are expected to play a leading role in this management.

In conclusion, I wish to sincerely thank all the experts and stakeholders involved in the formulation of this E-Waste Strategy.

PRINCIPAL SECRETARY

STATE DEPARTMENT OF ENVIRONMENT

MINISTRY OF ENVIRONMENT AND FORESTRY

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Several individuals and institutions have participated in the development of this National E-waste Strategy. I would like to recognize their efforts.

Sincere gratitude is extended to the National E-waste Steering Committee members for consistently working together to find a sustainable solution for E-waste management in Kenya, and for providing their respective technical inputs. Gratitude is also extended to the various stakeholders in Kenya for their valuable inputs and comments during national consultations and validation workshops.

The government is committed to implementing the E-waste strategy and all partners and stakeholders are invited to join in delivering this great mandate of ensuring a clean, healthy and sustainable environment.

Special thanks go to the following members of the E-waste Strategy Taskforce:

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## Executive Summary

The National E-waste Management Strategy is a five-year plan covering the period 2019/20 to 2023/24. The E-waste Strategy has five thematic areas aimed at resource mobilization for proper E-waste management, raising awareness, strengthening Kenya's E-waste coordination structures at national and county levels, put in place a monitoring and evaluation mechanism for E-waste management, promote research and innovation in E-waste management and have legal and regulatory framework for E-waste management in Kenya.

This Strategy applies both to the national and county governments. The strategy spells out the priority E-waste management strategies together with specific actions to help actualize them. The strategy estimates the size of investment required to execute the National E-waste Management strategy, the targeted potential sources of funding as well as capacity building measures. Further, the strategy highlights the key target outcomes and the indicators, which will assist in measuring success of implementation of the plan. The roles and responsibilities of the various stakeholders in executing the strategy are also defined.

Though this Strategy is a five-year plan covering the period 2019/20 to 2023/24, its vision and aspiration spans a medium to long-term period of about 10 years. This strategic direction is pertinent in aligning the short to medium-term interventions into the perspective plan of E-waste management.

The National E-waste management strategy has been developed on the backdrop of the E-waste challenges posed by the rapid diffusion of information and communications technologies (ICTs) in the country's economy. These challenges range from increasing stock piles of E-waste in the region to potential environmental and health problems associated with E-waste. Another key factor driving the formulation of the E-waste Management strategy is the need to build the capacity of the county governments in sustainable collection and management of E-waste.

There are a number of initiatives leading to the development of the national E-waste management Strategy. Below are some of the key factors leading to the formulation of the E-waste strategy.

- Lack of a readiness assessment within both the national and county governments. The country has not carried an assessment to inform the E-waste situation in Kenya
- The establishment of the East African Communications Organization (EACO) regional E-waste management steering committee and a regional strategy. The regional steering committee has prioritized E-waste management activities and their mainstreaming within East Africa
- Establishment of national E-waste management steering committees and/or E-waste management technical working teams

## Strategic Direction



The strategy charts the aspirations, goals and building blocks for sustainable management E-waste in Kenya. These are as follows:

Vision: “Towards Zero E-Waste in Kenya by 2030”.

Goal: “Achieve a sustainable E-waste management system in Kenya”.

In order to realize the above goal and steadily move towards attaining the vision; the following strategies have been prioritized:

- (i) Strengthen the policy, legal and regulatory framework for sustainable resourcing of E-waste management activities for effective protection of human health and environment in the country;
- (ii) Put in place the requisite E-waste management infrastructure and rationalize its distribution across the counties to harness unique value and enhance synergy;
- (iii) Establish mechanisms for comprehensive and sustainable mobilization of E-waste management resources (physical, financial and human resources);
- (iv) Promote research and innovation in E-waste management;
- (v) Put in place a monitoring and evaluation (M & E) mechanism for E-waste management; and
- (vi) Build capacity and create awareness for effective E-waste management in Kenya

These strategies resonate well with Article 69 of the Constitution of Kenya, 2010, which states that the government shall eliminate all activities and processes that are harmful to the environment. In addition, the vision 2030 envisioned the development of solid waste management systems in the five leading municipalities and the economic zones. The strategies and their corresponding actions address the binding constraints identified in each of five (5) strategic areas of intervention/themes, namely:

- i. Policy, Legal and Regulatory framework
- ii. Infrastructure for E-waste management
- iii. Resource mobilization
- iv. Awareness creation, Capacity building, Education and Research
- v. Monitoring and Evaluation

## Definition of terms

The following key terminologies will apply to E-waste management;

‘collection centre’ means a centre established individually or jointly or a registered society or a designated agency or a company or an association to undertake collection operations of E-waste;

‘consumer’ means user of electrical and electronic equipment or generator of E-waste;

“Deposit bonds” means advance recycling fee from the end user.

‘electrical and electronic equipment’ means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in schedule 5 of these regulation;

‘electrical and electronic equipment registry’ means a unit housed by the Authority for the purposes of effecting registration of all electrical and electronic equipment producers and recyclers;

‘entity’ includes Agency, organisation, establishment, business, partnership, body corporate with capacity to sue or to be sued;

‘environmentally sound management’ means taking all steps required to ensure that E-waste are managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such waste;

‘E-waste’ also referred to as waste electrical and electronic equipment means waste resulting from electrical and electronic equipment including components and sub-assemblies thereof;

‘generator’ means any person whose activities or activities under his or her direction produces E-waste or if that person is not known, the person who is in possession or control of that E-waste;

‘market’ means an environment that facilitates trading in Electrical and electronic equipment and E-waste;

‘manufacturer’ means an entity involved in the making or production of electrical and electronic equipment either locally or internationally;

‘minimum collection incentive’ means the minimum collection price paid by recyclers to the collection network to ensure collection of problematic fractions;

‘problematic fractions’ means components or parts of E-waste where the collection and treatment cost far outweighs the material recovery value;

‘producer’ means any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler;

‘recovery’ means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfill a particular function;

‘recycling’ means any operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes;

‘recycler’ means any person or entity engaged in recycling or reprocessing used electrical and electronic equipment or assemblies or their component;

‘refurbisher’ means any person who repairs, dismantles or re-assembles electrical and electronic equipment to extend the working life of the product;

‘refurbishing’ means the action of repair, dismantling, improvement of E-waste for the purposes of extending the working life of the product;

‘take-back’ means the process of returning or repossessing used products from the market to the producer or their representative;

‘transporter’ means a person or entity that is in the conduct of carrying or conveying E-waste from one point to another;

‘treatment’ means processing E-waste through modern and eco-friendly technologies to ensure compliance with environmental protection; and

‘treatment facility’ means a licensed plant, premise, and establishment for processing E-waste.

## CHAPTER ONE: PURPOSE AND PROCESS OF DEVELOPING STRATEGY

### 1.1 Background

E-waste is as one of the fastest growing waste stream in the world, and yet also toxic and non-biodegradable. All countries in the world combined generated a staggering 44.7 million metric tonnes of E-waste in 2016. The amount of E-waste is expected to increase to 52.2 million metric tonnes (Global E-waste monitor 2017). In Kenya the estimated volume of generated E-waste was 11,000mt per year (UNEP 2010).

According to the Global E-waste Monitor, 2017, E-waste is growing at 3 times the rate of municipal waste worldwide. The lowest amount of E-waste per inhabitant was generated in Africa; 1.9 kg/inch. However, little information is available on its collection rate.

Africa generated 2.2 Million metric tonnes (Mt) of E-waste, and with current data, only 4 kilotonnes (kt) were documented as collected and recycled; this is less than 1 %.

Holistically, the increased number of E-waste volumes results from the increasing market penetration of electronic use in developing countries, and the increase in replacement market due to technology advancement in the developed countries. The East African region has also suffered from the importation of used or obsolete Electrical and Electronic Equipment (EEE) under the name of donations, as well as the prohibitive prices for acquisition of new EEE. There is therefore a high demand for used products that have a short life span and easily find their way to the E-waste streams in the short-term.

EEE are composed of various components, i.e. hazardous and non-hazardous materials. The hazardous materials include; Lead Barium, Mercury, Nickel, Cadmium, Lithium etc. Components such as Lead and Mercury contaminate the soil and water when disposed of in the landfills with other waste. These hazardous components are also listed as human carcinogens.

The valuable materials in electronic products include the precious metals- (Gold, Tantalum, Silver etc.), while the non-hazardous components are; plastics, Copper etc. Recycling of the precious metals conserves these valuable materials as they are rare earth minerals. Recycling also prevents air and water pollution likely to result from the extraction of new mineral from the earth as well as reduction on greenhouse gas (GHG) emissions. Recovery of these precious metals may pose a positive impact to both the environment as well as socio-economic development issues.

The past decade has seen a tremendous increase of EEE in Kenya at the government, private sector as well as at individual levels. This increase has been made possible by enabling factors such as; the elimination of trade barriers in importation of ICT equipment, liberalization of the telecommunications sectors that has increased the use of mobile phones, fax and telephones; and the development of e-initiatives to improve service delivery.

Whilst much mention has been on the increasing investments in the ICTs because of its enormous advantages, it is also important to adequately reflect end of life (EOL) of such equipment, hence mention of electronic waste (E-waste) or waste electrical and electronics equipment (WEEE).

The information and communications technology (ICT) sector has been the major driver of economic growth in Kenya over the last decade, growing on an average of more than 30%. However, this rapid growth of ICT and economy has contributed to massive generation of electrical and electronic waste (E-waste) where, an estimated 50 million metric tons of E-waste is now generated worldwide every year, with most of this heading to developing countries including Kenya for re-use and disposal. E-waste poses both challenges and opportunities. Such challenges include: Environmental, safety and public health. On the other hand, E-waste presents opportunities to the various sectors and business enterprises such as green job creation, recovery of valuable materials and environmental protection.

It is against this background that the Ministry of Environment and Forestry is developing a five-year national E-waste Management Strategy that will help to sustainably and productively address the E-waste problem in the country. The strategy has been developed on the backdrop of the E-waste challenges posed by the rapid diffusion of information and communications technologies (ICTs) in the country's economy.

## 1.2 Purpose of the strategy

The strategy is important in providing stakeholders with information and roadmap in addressing the E-waste menace and opportunities in Kenya. The main stakeholders in E-waste generation and management are the government/policy makers, private sector (manufacturers, distributors/importers), and civil society (refurbishment centres, collectors, recyclers). However, most of East Africa's E-waste is dealt with by the informal sector with little or no regulation and no existing strategy for E-waste management and recycling systems.

The purpose of the strategy is to analyze the situation and prescribe ways to address the problems. The document aims at helping leaders, policy makers, decision makers and stakeholders at all levels understand the need to take urgent action in diverse fronts through collaborative process to minimize negative impacts of E-waste on the environment and human health.

## 1.3 Process of developing the strategy

Kenya is a member of EACO which has a regional E-waste strategy. To align Kenya's interventions with the East African regional initiatives, the Ministry took up the development of the national E-Waste Strategy as a key performance contract target for financial year 2018-19.

Kenya has had the multi-agency National E-waste Management committee for years. In December 2018 the Ministry tasked the committee to initiate the process of developing the national E-waste strategy. Through a series of meetings and workshops, the first draft was developed and submitted in January 2019.

In January 2019 a public notice was made in the Kenyan dairies for the public to participate in giving their comments about the strategy. An email platform was established to receive these comments. In addition, public participation meetings were held in the six regional economic blocks with participation drawn from all counties. Further comments were solicited from line

ministries and specific institutions who were invited to submit oral and written comments on the E-waste Strategy.

These public comments were consolidated and used to develop the revised e-waste strategy document. The Ministry of Environment and Forestry further invited experts from Danish government, Netherlands government, UNEP and UNHABITAT to give their technical views regarding the revised document.

The next step will be to take the document for national validation workshop on 24th May 2019 at KICC before it is signed and adopted for implementation.

## CHAPTER TWO: CURRENT SITUATION OF E-WASTE IN KENYA

### 2.1 Status of E-waste in Kenya

Kenya has identified ICT as an enabling factor for transforming the region into an information society. The ICT industry has been growing exponentially through initiatives such as e-government, e-education, e-medicine, e-commerce etc. Some of the reasons for this growth include removal of tax levies on computers; promotion of e-learning in basic education and institutions of higher learning; rapid expansion of the telecommunication industry; the launch of the e-government strategy (2004) and availability of cheap ICT devices. These initiatives have created a huge demand for computers and related accessories. However, this emphasis on universal affordable access to ICTs has not been reciprocated with paying equal attention to the associated environmental impact of end of use waste.

This enabling environment has led to high proliferation of mobile devices. In 2018, Kenya had a total of 45.6 million mobile subscribers as per the statistics given by Communications Authority of Kenya. The number of Internet users has also increased tremendously in Kenya to 41.1 million in 2018. (CA, 2018). Statistics show that in the year 2007, Kenya generated 2,800 tonnes of E-waste from TVs, 2,500 tonnes from personal computers and 150 tonnes from mobile phones. The estimated quantities for printers and refrigerators are respectively 500 tonnes and 1,400 tonnes (UNEP, 2010).

The landing of three fiber optic cables in the region heralds an era of exponential growth of access to and use of information and communications technologies (ICTs). With this growth, it is expected that the region will produce more E-waste as the people discard obsolete computers, television sets, mobile phones and other ICT equipment. Further, donations of second-hand equipment, the transition to digital broadcasting and the rapid turnover in technology are likely to compound the problem.

A study funded by Hewlett-Packard, the Global Digital Solidarity Fund (DSF) and the Swiss Federal Laboratories for Materials Testing and Research (Empa) in 2007 indicates that the private sector has the largest computer stocks and generates two thirds of the related waste flow in Africa. The private sector cites lack of infrastructure and policy as some of the obstacles contributing to poor E-waste management.

The E-waste guidelines (NEMA 2010) identify the main stakeholders in E-waste generation and management as the government/policy makers, private sector (manufacturers, distributors/importers), and civil society (refurbishment centers, collectors, recyclers). However, most of Kenya's E-waste is dealt with by the informal sector.

### 2.2 Challenges in E-waste management

Some of the major challenges in E-waste management in Kenya is lack of regulation, lack of a guiding policy and strategy, inadequate capacity, skills, resources and infrastructure such as

recycling systems to address the challenge effectively. Currently, there are only 3 recyclers licensed to handle E-waste in Kenya.

At County Level, some Counties such as Machakos County has developed an E-waste Act addressing diverse issues (County Government of Machakos, 2015).

Although there have been initiatives by reputable firms to manage E-waste such as Nokia's recycling scheme and Computer for Schools refurbishment programme, the practices for managing E-waste are mostly handled by the informal sector (Jua Kali). Most of these informal operators have inadequate skills, are neither registered nor authorized and operate in a secretive manner. The processes are highly toxic and impact adversely to both the environment and human health.

The lack of clear disposal mechanisms has resulted in excessive stocks being held by the consumer. A lot of the old technology is held in storage due to a lack of clear strategies and processes for disposal.

Disposal options vary widely depending on the user. Government ministries and departments have to bond the computers and invite competitive tenders for disposal as scrap in line with procurement procedures. The process is slow and results in obsolete computers being held in government stores.

Private sector corporations often donate the computers as charity to deserving users. Collectors, refurbishers and the recycling infrastructures are generally not developed and therefore the flow down the value chain has much lower volumes.



## 2.3 Current E-waste recycling initiatives in Kenya

Due to inadequate E-waste management, initiatives by different stakeholder groups have arisen across Africa to collect, treat and properly dispose of E-waste (Global Waste Management Outlook, UNEP,2015). In Kenya, several initiatives have been undertaken and these includes.

- The WEEE Centre is an E-waste recycling organization owned and operated by local entrepreneurs with sustained support from various local and international partners. It provides E-waste collection, dismantling and automated processing services in Nairobi and in other major cities in Kenya. The valuable materials are sold to local recycling facilities. Its partnership with international partners enables the shipping of hazardous and non-valuable e-waste fractions to international recyclers and smelters.
- Safaricom Limited actively participates in collection of used phones and other e-waste and safe disposal of the same. It has partnered with local institutions such as the WEE Centre to receive the collected waste for dismantling and further processing. Safaricom has invested heavily in raising public awareness and runs collection drives to ensure safe disposal of electronic gadgets. The company use its network of retail shops across the country as collection centres. Together with the Waste Electrical and Electronic Centre (WEEE Centre), the company has managed to collect over 850 tonnes of E-waste from customers and consumers.
- Sintmund Group is a licensed company operating advanced recycling facility for e-waste such as bulbs, batteries, fridges, freezers, cartridges, computers among others.
- Sinomet Kenya Limited is a company specializing in waste transportation, treatment/disposal and trans-boundary movement of waste with special emphasis on E-waste. Established in 2011, Sinomet has transformed itself into a big trans-boundary mover of E-waste through its international recyclers and up-cyclers of E-waste while also maintaining close ties with its local scrapping partners.
- E-waste Initiative Kenya (Ewik) is a Kenyan based NGO dealing with electronic waste management specifically in the informal sector, providing a safe disposal option across the country through their networks.

## 2.4 Policy and Legal Framework for E-waste Management

### 2.4.1 Global

A number of international conventions, protocols and laws provide guidance and standards for E-waste management.

These include:

1. Basel Convention on Trans boundary Movement of Hazardous Waste, and Disposal, (1992)
2. Ban Amendment (2004)

3. The Vienna Convention for the Protection of the Ozone Layer.
4. Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
5. The Stockholm Convention on Persistent Organic Pollutants (2004).
6. Kyoto protocol.
7. Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991).
8. Africa agenda 2063
9. Maputo protocol
10. Basel, Stockholm and Rotterdam convention.

Kenya is a party to all these conventions.

#### **2.4.1.1 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989):**

The Basel Convention aims to protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes. Among key provisions of the Basel Convention are the environmentally sound management, transboundary movement, waste minimization and waste disposal practices aimed at mitigating adverse effects on human health and the environment. E-waste is included in Annex VIII, added to the convention in 1998 by the 4th meeting of the conference of the parties (Decision IV/9).

#### **2.4.1.2 Montreal Protocol on Ozone Depleting Substances (1989)**

The Montreal Protocol is an international treaty which aims to protect the ozone layer by phasing out the production and use of ozone depleting substances (ODS). ODS, chlorofluorocarbons (CFCs) and hydro chlorofluorocarbon (HCFCs) as refrigerants which are still used in some refrigerators and air conditioners. Waste refrigerators and air conditioners will also likely contain CFCs or HCFCs.

#### **2.4.1.3 International Convention for the Prevention of Pollution from Ships (MARPOL) (73/78/97)**

Together with its 6 annexes, MARPOL addresses oil pollution from ships, from noxious liquid substances carried in bulk, from harmful substances carried by sea in packaged form, from sewage and garbage and the prevention of air pollution from ships. MARPOL has greatly contributed to a significant decrease in pollution from international shipping and applies to 99% of the world's merchant tonnage. In particular, MARPOL Annex V generally prohibits the discharge of all waste into the sea, unless explicitly permitted under the Annex. Among other wastes, MARPOL includes E-waste generated during the normal operation of ships and its liability of being disposed of continuously or periodically

#### **2.4.1.4 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)**

The Rotterdam Convention promotes shared responsibilities in relation to the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm. The convention promotes open exchange of information about their characteristics, by providing for a national decision-making process on their import and export

and by disseminating these decisions to parties. It also calls on exporters of hazardous chemicals to use proper labelling, to include directions on safe handling, and to inform purchasers of any known restrictions or bans.

#### **2.4.1.5 Stockholm Convention on Persistent Organic Pollutants (2001)**

The Stockholm Convention is a global treaty designed to protect human health and the environment from chemicals that remain intact in the environment for long periods of time, that become widely distributed geographically, that accumulate in the fatty tissues of humans and wildlife, and that have harmful impacts on human health or on the environment. There are several persistent organic pollutants present in E-waste, and the listing of E-waste requires parties of the Stockholm Convention to take appropriate measures to eliminate the release of these pollutants from stockpiles and wastes

#### **2.4.1.6 The Basel Convention Ban Amendment 1994**

The “Ban Amendment” provides for the prohibition by each Party included in the proposed new Annex VII (Parties and other States which are members of the OECD, EC, Liechtenstein) of all trans boundary movements to States not included in Annex VII of hazardous wastes covered by the Convention that are intended for final disposal, and of all trans boundary movements to States not included in Annex VII of hazardous wastes covered by paragraph 1 (a) of Article 1 of the Convention that are destined for reuse, recycling or recovery operations.

The Ban Amendment was originally adopted as a decision of the second meeting of the Conference of the Parties in March 1994. The Secretariat provides assistance to parties that are facing difficulties in ratifying the Ban Amendment, on request and within available resources.

Only Kenya and Tanzania have ratified the Ban Amendment

#### **2.4.1.7 Paris Climate Agreement under the United Nations Framework Convention on Climate Change**

The Paris Agreement’s central aim is to strengthen the global response to the threat of climate change by keeping the global temperature rise this century below a “2-degree Celsius above pre-industrial levels”, and to pursue efforts to limit the temperature increase even further to “1.5 degrees Celsius”. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. It recognizes that sustainable lifestyles and sustainable patterns of consumption and production, with developed country parties taking the lead, play an important role in addressing climate change.

#### **2.4.1.8 Connect 2020 Agenda for Global Telecommunication/ICT Development**

This global agenda sets out the shared vision, goals and targets that Member States of the International Telecommunication Union (ITU) have committed to achieve by 2020. These targets will be achieved in collaboration with stakeholders within the ICT ecosystem. With the adoption of the Connect 2020 Agenda, ITU Member States have committed to transitioning to an information society, empowered by the interconnected world, where telecommunication/ICT enables and accelerates socially, economically and environmentally sustainable growth and development for everyone. One of the key goals of the Connect 2020 Agenda is sustainability. Within this specific goal, target 3.2 addresses the issue of E-waste through reducing the volume of redundant E-waste by 50% by 2020.

## 2.5 Regional

### 2.5.1. Bamako Convention

The Bamako Convention is an African expression of Africa's unity to prevent Africa from becoming the final destination of hazardous waste produced elsewhere. The Convention requires Parties to ban the import of hazardous and radioactive wastes as well as all forms of ocean and inland water dumping or incineration of hazardous waste. It also requires Parties to minimize the trans-boundary movement of wastes among themselves and only conduct it with consent of the importing and transit States. The Convention also requires Parties to minimize the production of hazardous wastes and cooperate to ensure that wastes are treated and disposed of in an environmentally sound manner.

The Bamako convention establishes the precautionary principle and provides for the sound management of these wastes within the continent.

Kenya has signed but not yet ratified the convention

### 2.5.2 Maputo protocol

The protocol to the African charter on human and people's rights guarantees the right of women to live in a healthy and sustainable environment. This includes ensuring that parties take all appropriate measures to regulate the management, processing, storage and disposal of domestic waste and ensure that proper standards are followed for the storage, transportation and disposal of toxic waste.

### 2.5.3 Agenda 2063: The Africa We Want (2013)

This is a 50 year strategic socio economic transformation framework for the African continent. The agenda 2063 implementation plan (2014-2023) outlines specific goals to be achieved during the first ten years, including reference to the expected transformation of waste management. Goal 1 aspires a high standard of living, quality life and wellbeing for all citizens. Priority 4 aspires modern, affordable and livable habitats and basic quality services, hence cities will be recycling at least 50% of the waste they generate by 2023.

The East Africa Member States have also been concerned about the E-waste problem in the region. To address these challenges, the EACO Regional E-waste Management Strategy 2017 was developed. Further, the EAC Member states were encouraged to develop national E-waste Management Strategies.

### 2.5.4 The Durban Declaration, Africa (2008)

The declaration called for an African regional platform/forum on E-waste alongside international bodies. The requirements of the declaration requires countries to review existing legislation, improve their compliance with legislation and amend existing legislation regarding E-waste management.

### 2.5.5 The Libreville Declaration, Africa (2008)

As an outcome of the first inter-ministerial conference on health and the environment in Africa, the declaration recognized that there is a need to further research the vulnerability of humans to environmental risk factors, and to establish policies to increase this understanding. These include risk factors for poor health which can arise from E-waste.

## 2.6 National

In Kenya environmental management is anchored in the constitution of Kenya 2010, national environmental policy (2013), environmental management and coordination act (1999) and the revised EMCA cap 387 EMC (waste management) regulation 2006, E-waste guidelines (2010) and the national solid management strategy (2015). E-waste is currently categorized as hazardous waste under EMCA cap 387 and the E-waste regulations prohibits the handling, transportation and disposal of waste without valid licenses issued by the National Environment Management Authority (NEMA). Further, NEMA in 2010 formulated the National E-waste Guidelines to assist the government, private sector, learning institutions and other stakeholders to manage WEEE effectively to enhance environmental conservation. These guidelines include approaches to enhance environmental protection; environmental awareness; categories of E-waste, E-waste treatment technologies and disposal procedures.

The Constitution of Kenya 2010 gives the right to every citizen to a clean and healthy environment under Article 42. In addition, Article 69 obligates the government to eliminate any processes that are deleterious to the environment. Further, the Constitution provides that any Convention that the Country has ratified becomes part of the national laws.

The main source of entry of electronics in Kenya is through import of (brand new and second-hand) equipment and local assembly. However, a significant portion of this is still in the hands of consumers who do not know how to dispose it off in an environmental sound way without losing the residual value they attach to it.

The current total E-waste levels collected is not documented and most of it ends up at Dandora dumpsite in Nairobi and other dumpsites in the country. With the lack of a specific government policy on E-waste, best practices are hard to achieve. In addition, when the EEE comes to end of life, individuals and corporates hoard the products in stores and homes for lack of awareness on E-waste management facilities.

Vision 2030 recognized that Kenya cannot attain high economic and social development without prioritizing environmental management especially the reduction of pollution. In this regard, waste management including E-waste was prioritized as a flagship project. The Medium-Term Plan 3 (MTP) 2018-2022 document prioritized E-waste as an emerging waste category with an emphasis on support to SMEs to manage waste.

The National ICT Policy, 2006 requires that EEE dealers demonstrate their readiness to minimize the effects of their infrastructure on the environment before they can have their licenses renewed by the Communications Authority of Kenya. This is geared towards ensuring that institutions generating E-waste take full responsibility to conserve and protect the environment from the harmful effects of WEEE.

Kenya is in the final stages of enacting E-waste regulations under the EMCA 1999. These regulations provide a framework for regulating handling of E-waste by diverse players in Kenya.

The Public Procurement and Disposal Act, No.33 2015, Part XIV governs disposal of public assets in public institutions. Section 165(2) prescribes that electronic and radioactive waste shall be disposed of only to persons licensed to handle the respective E-waste under section 88

of the Environmental Management and Co-ordination Act, 1999. However, the Act is silent on consideration of the end-of-life effects of EEE procured.

## 2.7 Types of E-waste streams

The following are the diverse types of E-waste:

Category	Examples
<p>Large household appliances</p>	<p>Large cooling appliances</p> <p>Refrigerators</p> <p>Freezers</p> <p>Other large appliances used for refrigeration, conservation and storage of food</p> <p>Washing machines</p> <p>Clothes dryers</p> <p>Dish washing machines</p> <p>Electrical Cooking equipment</p> <p>Electric stoves</p> <p>Electric hot plates</p> <p>Microwaves</p> <p>Other large appliances used for cooking and other processing of food</p> <p>Electric heating appliances</p> <p>Electric radiators</p> <p>Other large appliances for heating rooms, beds, seating furniture</p> <p>Electric fans</p> <p>Air conditioner appliances</p> <p>Other fanning, exhaust ventilation and conditioning equipment</p>
<p>Small household appliances</p>	<p>Vacuum cleaners</p> <p>Carpet sweepers</p> <p>Other electrical appliances for cleaning</p> <p>Appliances used for sewing, knitting, weaving and other processing for textiles</p> <p>Ironing, mangling and other clothing appliances.</p> <p>Toasters</p>

	<p>Fryers</p> <p>Grinders, coffee machines and equipment for opening or sealing containers or packages</p> <p>Electric knives</p> <p>Appliances for hair-cutting, hair drying, tooth brushing, shaving, massage and other body care appliances</p> <p>Clocks, watches and equipment for the purpose of measuring, indicating or registering time</p> <p>Scales</p>
<p>IT and telecommunication equipment's</p>	<p>Centralized data processing:</p> <ul style="list-style-type: none"> <li>a. Mainframes</li> <li>b. Minicomputers</li> <li>c. Servers</li> </ul> <ul style="list-style-type: none"> <li>ii. Printer units</li> <li>iii. Personal computing:</li> </ul> <p>Personal computers (CPU, mouse, screen and keyboard included)</p> <p>Laptop computers (CPU, mouse, screen and keyboard included)</p> <p>Notebook computers</p> <p>Notepad computers</p> <p>Copying equipment</p> <p>Electrical and electronic typewriters</p> <p>Pocket and desk calculators and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means</p> <p>User terminals and systems</p> <p>Facsimile</p> <p>Telex</p> <p>Telephones</p> <p>Pay telephones</p> <p>Cordless telephones</p> <p>Cellular telephones</p> <p>Answering systems and other products</p> <p>Broadcasting equipment for transmitting sound, images or other information by telecommunications</p>

	Other products or equipment for the purpose of recording or reproducing sound or images, including signals or other technologies for the distribution of sound and image than by telecommunications
Consumer equipment	Radio sets Television sets Video cameras Video recorders Hi-fi recorders Audio amplifiers Musical instruments
Lighting equipment	Luminaries for fluorescent lamps. Straight fluorescent lamps Compact fluorescent lamps High intensity discharge lamps, including pressure sodium lamps and metal halide lamps Low pressure sodium lamps Other lighting or equipment for the purpose of spreading or controlling light. Florescent tubes
Electrical and electronic 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 Tools for mowing or other gardening activities
Toys, leisure and sports equipment	Electric trains or car racing sets Hand-held video game consoles Video games Computers for biking, diving, running, rowing, and other similar gadgets.



	<p>Sports equipment with electric or electronic components</p> <p>Coin slot machines</p>
<p>Medical devices (with the exception of all implanted and infected products)</p>	<p>Radiotherapy equipment</p> <p>Cardiology</p> <p>Dialysis</p> <p>Pulmonary ventilators</p> <p>Nuclear medicine</p> <p>Laboratory equipment for in-vitro diagnosis</p> <p>Analyzers</p> <p>Freezers</p> <p>Other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability</p>
<p>Monitoring and control instruments</p>	<p>Smoke detector</p> <p>Heating regulators</p> <p>Thermostats</p> <p>Measuring, weighing or adjusting appliances for household or as laboratory equipment</p> <p>Other monitoring and control instruments used in industrial installations</p>
<p>Automatic dispensers</p>	<p>Automatic dispensers for hot drinks</p> <p>Automatic dispensers for hot or cold bottles or cans</p> <p>Automatic dispensers for solid products</p> <p>Automatic dispensers for money</p>
<p>Batteries</p>	<p>Alkaline</p> <p>Lithium ion</p>
<p>Security and Military Equipment</p>	<p>Drones</p>

Adopted from the NEMA E-waste guidelines 2010

## **2.8 Consequences of poor E-waste handling**

The ecological, economic and social consequences resulting from poor handling and management of E-waste include:

### 2.8.1 Environmental consequences

- Air pollution, especially when E-waste is burnt
- Waste management problem of non-biodegradable equipment
- Toxicity and radioactive nature of E-waste degrades the environment
- Blockage of water runoff channels

### 2.8.2 Economic consequences

- Substantial public spending on health care
- Investments in complex and expensive environment remediation technologies
- Loss / waste of resources that can be recycled for re-use
- Opportunities for recycling industries and employment lost
- Ozone depletion has led to unpredictable weather conditions.

### 2.8.3 Social consequences

- E-waste affects people's health (e.g. lead and mercury poisoning).
- Growth of informal waste disposal centers in the neighborhood
- Informal trade and management of E-waste
- Loss of appreciation for ICT

## **2.9 Current E-waste management practices**

The current trends for E-waste management are as follows.

### 2.9.1 Segregation of Waste at source

In some organizations waste is segregated at source and handed over to the service providers for further treatment. Some households segregate at source but the waste is mixed during collection. Currently E-waste is not collected separately from other waste streams.

### 2.9.2 Collection

The existing collection centers are established individually or jointly or as registered society. They could also be owned by a designated agency, a company or an association to undertake collection operations of E-waste;

The established collection centers contract or sub contract the E-waste collectors normally known as 'scavengers' to supply them with the waste.

### 2.9.3 Transportation

Once general waste is collected at designated places, the contracted service providers collect and take it to dumping sites and recycling facilities for processing. The service providers are licensed for transporting waste by NEMA.

### 2.9.4 Recycling

There exist both formal and informal recycling activities in the Kenyan market with scanty information on the volumes collected and processed. A Few companies have been licensed by NEMA as E-waste recyclers. In 2019, these companies included Waste Electrical and Electronic Equipment Centre (WEEE Centre), Sinomet Kenya, Sintmund Kenya and E-waste Initiative Kenya (Ewik).

### 2.9.5 Refurbishing

There is a growing number of licensed entrepreneurs and organized groups which are refurbishing E-waste in the country with the intent of increasing product lifespan.

### 2.9.6 E-waste take back

There are efforts by a few manufactures who have introduced take-back programmes in the country. However, there is lack of consistency and awareness to the public.

### 2.9.7 Trans-boundary waste movement

Kenya being a signatory to Basel Convention 1994, trans-boundary movement of waste includes import of waste originating from a foreign country into Kenya as well as export of waste outside country into another country and transit of waste through the country. However Kenya is not a signatory to the Bamako convention.

## **2.10 The E-waste Challenges and Opportunities in Kenya**

### 2.10.1 The E-waste challenges.

Kenya faces diverse challenges in managing e-waste and these includes:-

- lack of legislation
- Inadequate infrastructure for E-waste management.
- absence of frameworks for end-of-life (EoL)
- no comprehensive product take-back and implementation of extended producer responsibility (EPR) system in place
- lack of citizen awareness on the harmful effects of WEEE on the environment, their health and safety
- Poor methods of E-waste treatment and disposal that discharge harmful heavy metals such as mercury and lead into the environment, depletion of the ozone layer, blocking water drainage channels.
- Lack of consumers ability to purchase brand new EEE, leading to consumption of second-hand or refurbished products which are cheaper but have a shorter life-span.
- The government agencies dealing with waste management have generalized E-waste as part of solid waste. Hence, E-waste management has not been given the priority it deserves at the national level.
- The Government agencies have limited capacity, inadequate resources to effectively address the problems and challenges associated with E-waste.
- Inadequate regulatory framework to deal effectively with WEEE management.
- The national Government has not streamlined mechanisms for the county Governments to separate WEEE from other solid wastes, store, collect, transport and process E-waste in a structured manner.

#### 2.10.2 E-waste opportunities

Despite the problem of E-waste, it contributes many useful benefits and opportunities. Proper management of E-waste using environmentally sound systems presents numerous socio-economic opportunities that can stimulate entrepreneurship, employment and enhancement of livelihoods. The Government can use the sector to raise the standards of living and poverty eradication. E-waste opportunities can be considered at several levels.

1. Recycling level. This involves converting fractions of E-waste into useful products. This can contribute to production of waste bi-products which can be used to feed other local industries. Organizations and individuals that are licensed to recycle create job opportunities or self-employ themselves.
2. Dismantling and refurbishing level. The refurbisher extends the functional life of electronic or electrical equipment by breaking apart the end of use equipment and selling the parts that can still be used. Some equipment can be dismantled and some valuable parts re-used for repairs or precious metals like gold, silver and copper reclaimed and availed for other useful purposes. This process, besides creating job opportunities, saves the environment by diverting large volumes of E-waste from energy-intensive down cycling processes where the equipment is reverted to raw materials for use in manufacturing. The environmental and social

benefits of refurbishing and reuse include diminished demand for new products and virgin raw materials and diminished use of landfills.

3. Collection level. Through the Producer Responsibility Organization (PRO) and take back systems, those who collect E-waste and hand it over to recyclers, refurbishers and treatment plants are paid a take back fee which improves their livelihoods.
4. Creation of urban mining. It is a fact that E-waste contains hundreds of tonnes of various metals. These metals can be isolated, treated and made available for use in new forms. This is done by establishing metal separation facilities. This process not only creates employment but also reduces metal loading and reduces the risk of soil contamination, besides making available new metals for use.

## 2.11 SWOT ANALYSIS

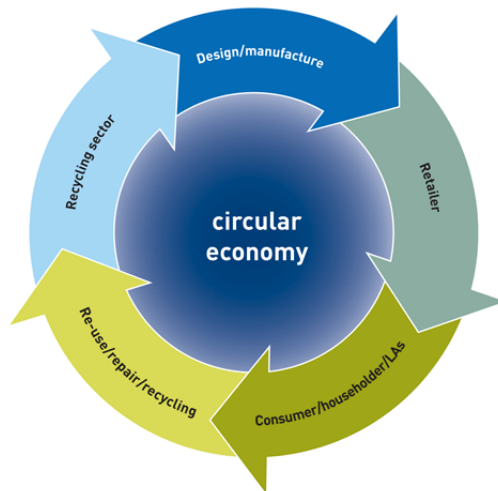
STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>- Model the national waste management policy framework in place</li> <li>- Political commitment through the ratification and adoption of relevant policies, laws and conventions</li> <li>- Existence of E-waste management coordination structures at regional and national levels (EACO WG 10, National steering committee)</li> <li>- Improved appreciation on awareness of E-waste matters across the board (political, technical and general public)</li> <li>- Implementation of E-waste management initiative of EACO e.g. studies/ statistics( study on going)</li> <li>- Existence of some basic E-waste management infrastructure within the country</li> <li>- Existence of enabling environment at national level such as EMCA Act, 1999; E-waste regulations 2019.</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of adequate statistics on E-waste generation in the region</li> <li>- Limited coordination of E-waste activities at both at national and regional level</li> <li>- Lack of comprehensive awareness on E-waste especially among end-users, decision makers.</li> <li>- Limited expertise in E-waste management within the region</li> <li>- Inadequate E-waste management infrastructure and facilities.</li> <li>- Insufficient E-waste policies laws and regulations and weak enforcement of existing ones and lack of harmonization of the existing ones</li> <li>- Unpredictable flow of resources on e-waste management</li> </ul>
<ul style="list-style-type: none"> <li>- Existence of downstream market for some fractions of E-waste in Kenya.</li> </ul>	
OPPORTUNITIES	THREATS
<p>Political</p> <ul style="list-style-type: none"> <li>- Global push on E-waste management issues and initiatives by ITU, UN</li> </ul>	<p>Political</p> <ul style="list-style-type: none"> <li>- Political instability in the country</li> </ul>

<p>activities through UNFCCC, UNEP, Basel and Bamako Convention, StEP</p> <ul style="list-style-type: none"> <li>- Regional integration and the EAC policy harmonization framework</li> <li>- Global conventions, protocols, declarations.</li> </ul>	
<p>Economic</p> <ul style="list-style-type: none"> <li>- Economic opportunities arising from E-waste management</li> <li>- Business and employment</li> <li>- Potential for export growth</li> </ul>	<p>Economic</p> <ul style="list-style-type: none"> <li>- Affluent societies – High consumption</li> <li>- Counterfeit of substandard goods</li> </ul>
<p>Social</p> <ul style="list-style-type: none"> <li>- Growing activism on environment and Green computing</li> <li>- Increased Awareness of negative impact of E-waste – Public health</li> <li>- Potential positive effects on special impact groups such as women, youth and PWDs – people with disabilities.</li> </ul>	<p>Social</p> <ul style="list-style-type: none"> <li>- Booming informal sector in the region</li> <li>- Social practices and culture in handling E-waste (holding on items due to emotional attachment)</li> </ul>
<p>Technology</p> <ul style="list-style-type: none"> <li>- Availability of available technologies</li> </ul> <p>Best practices for Bench mark</p>	<p>Technology</p> <ul style="list-style-type: none"> <li>- Changing of technology making the ICT equipment's inseparable</li> </ul> <p>Rudimentary technology like incineration or burning.</p>
<p>Environment</p> <ul style="list-style-type: none"> <li>- Urban mining</li> <li>- Reduced Greenhouse gases emissions</li> </ul>	<p>Environment</p> <ul style="list-style-type: none"> <li>- Continued Poor disposal methods hence pollution to the environment</li> <li>- Non segregation of waste</li> </ul>
<p>Legal</p> <p>Alignment of the existing policies and laws to the emerging WEEE issues.</p>	<p>Legal</p> <p>Inadequate political will</p>

## CHAPTER 3: PREFERRED APPROACH TO E-WASTE MANAGEMENT

### 3.1 Approach to E-waste management

In view of the above situational analysis, this strategy will adopt a circular economy as its preferred approach to E-waste management:



Besides creating new opportunities for growth, a more circular economy will:

- I. Reduce waste, drive greater resource productivity and deliver a more competitive Kenyan economy.
- II. Position Kenya to better address emerging resource security/scarcity issues in the future and help reduce the environmental impacts of our production and consumption in Kenya.
- III. Facilitate establishment of legal and regulatory framework for E-waste management
- IV. Develop an integrated WEEE management system in dialogue with all stakeholders, including importing companies and existing recycling facilities.
- V. Provide for the establishment of a data base of E-waste stakeholders in the WEEE management system to facilitate availability of reliable and up to date E-waste data.
- VI. Promote, support and enforce the establishment of an E-Waste extended producer responsibility principle
- VII. Have in place an incentive mechanism to encourage stakeholders and users of EEE to facilitate E-waste management and reduce WEEE.
- VIII. Establish a mechanism that will facilitate: segregation of WEEE at source; provide for collection points, holding grounds, transfer stations and treatment facilities.
- IX. Provide for financing for E-waste management systems
- X. Create awareness and capacity building programs at National and County levels for E-waste stakeholders.

- XI. Establish monitoring and evaluation modalities for E-waste management
- XII. To tackle the problem of “sham reuse”, with a criteria for the imports of EEE, with a clarification within the E-waste regulations, guidelines and standards

### **3.2 Principles of E-waste management**

This strategy prioritizes the following circular economy practices in E-waste management.

1. Create an enabling environment for re-use and life time extension of EEE, its components and other accessories
2. Promote activities aimed at resource recovery and recycling of E-waste materials into useful products
3. Embrace best available technologies and best available practices in E-waste management.

### **3.3 Strategic interventions for E-waste management in Kenya**

The following interventions will be undertaken to implement the E-waste strategy

#### **3.3.1 Policy, legal and regulatory framework**

To ensure protection of human health and environment, and create enabling conditions for sustainable E-waste management, this strategy seeks to develop and harmonize policy, legal and regulatory framework for E-waste management in Kenya.

There will also be a need to ensure harmonization of other laws and lobbying for international conventions/ treaties to be in tandem with E-waste management principles.

#### **Strategic Actions**

1. Develop a national E-waste policy, regulations, and EEE standards and cascade to the counties.
2. Review, identify gaps and streamline the existing Policy, laws, EEE standards and guidelines to be in line with best practices in E-waste management
3. Enactment and operationalization of the draft Environmental Management Coordination (Electrical and Electronic waste management) regulations 2019
4. Harmonization of county policies, Acts, regulation, guidelines and standards to the national legal and regulatory framework.
5. Establish and enforce EPR (Extended Producer responsibility) and ARF (Advanced recycling fee) principles in national policy to enhance producer and generator participation in E-waste management.
6. Provide for incentives to promote E-waste management

#### **3.3.2 Public Awareness, education, research and capacity building on E-waste**



This strategy will promote creation of awareness, education, and research and capacity development on E-waste Management.

The identified strategic actions include:

1. Raise public awareness about E-waste and its management.
2. Develop and disseminate simplified version of strategy, guidelines, regulations and standards
3. Build capacity on E-waste management amongst stakeholders
4. Disseminate the simplified version national E-waste management strategy, guidelines, regulations and standards
5. Participate in regional and international fora on best practices in E-waste management.
6. Develop and disseminate brochures, fliers, pamphlets, advertisements etc. on E-waste management.
7. Develop education curriculum at all levels of education and encourage research and development on E-waste.
8. Develop a system of collection of reliable, accurate and up to date data on EEE and generated WEEE in the country.
9. Promote compliance of section 165(2) of the Public Procurement and Disposal Act 2015 in disposing of their E-waste.

### 3.3.3 Infrastructure for E-waste management

The strategy will identify existing infrastructure gaps and come up with mechanisms to bridge the gaps in the country. The identified gaps will be addressed by enhancing existing facilities or setting up new facilities at national or county levels.

#### Specific Actions

The priority interventions areas in infrastructure for E-waste management will include the following:

1. Conduct an E-waste management infrastructure requirements analysis
2. Develop an E-waste management infrastructure roll out plan
3. Put in place appropriate mechanisms for segregation of E-waste at source, collection, transportation, and processing.
4. Facilitate the development of dismantling and recovery facilities within the country's regional economic blocks.
5. Encourage trade-in of electronic and electrical equipment (to promote reuse principle).
6. Develop guidelines on the basic requirements for establishment of E-waste collection centers and recycling facilities.
7. Carry out a baseline survey of the informal sector dealing with E-waste.

### 3.3.4 Resource mobilization for E-waste management.

Sustainable E-waste management is a resource intensive process. This requires adequate availability of resources - physical, human and financial resources. Therefore a resource mobilization mechanism has been identified as a critical component of this strategy.

## Strategic Actions

The following strategic actions have been identified as a means of mobilization of adequate resources for E-waste management and ensure predictability and sustainability:

1. Conduct a funding needs assessment for E-waste management
2. Conduct a study to determine the EPR fees or Advance Recycling fees.
3. Create a national E-waste management fund.
4. Develop and Streamline funding mechanisms for E-waste management within the counties.
5. Engage regional, international organizations and private corporations for resource mobilization.

### **3.4 Monitoring and evaluation**

This strategy will be continuously monitored to ensure compliance with set timelines. It will also be periodically evaluated to determine the extent to which its objectives are being achieved. The monitoring and evaluation will be guided by the action matrix attached herein. The scope of monitoring and evaluation shall consist but not limited to

1. Monitoring on state of E-waste management in Kenya
2. Collection of data on import, export and transit of EEE and WEEE.
3. Provide information on the impact of the generated WEEE on the environment.
4. Collection, submission of data on the quantities, state, type and origin of the generated, processed and disposed WEEE.

To be able to gauge to what extent the target outcomes have been realized, a monitoring and evaluation framework for the plan will be developed. The framework will identify the anticipated outcomes and results of the strategy – both immediate and long term. For each result (outcomes and outputs) baseline conditions and targets will be identified to show the current status and help in assessing changes in the indicators over time.

### **3.5 Conclusion**

E-waste management is a major challenge in Kenya. There are huge stocks that consumers are piling in homes, offices and other storage facilities. The government will be on the forefront in charting the way forward in promoting strategies that enable broader participation in E-waste management. The government will partner with private firms through Public-Private-Partnerships (PPP) to build robust and sustainable infrastructure to facilitate an environmentally friendly E-waste management system and provide incentives for consumers to dispose their WEEE. The government will consider facilitating NGOs, local investors and private organizations by providing them with tax exemptions on E-waste recycling equipment and land on which to put up E-waste management facilities and infrastructure.

The government will consider promoting both formal and informal E-waste sectors by funding their initiatives through Constituency Development Fund (CDF), Youth, Women and Persons with Disability (PWD) and EPR levies to improve efforts toward WEEE management in the country.

The government will also provide incentives for International companies or investors who are willing to partner in refurbishment of old EEE and take-back programs to ease the WEEE burden in the country.

The government will also put in place mechanisms for tracking mass flow of WEEE in and out of the country by use of well-defined models so that it can identify their sources and distribution channels for effective management.

## ANNEX 1: NATIONAL E-WASTE STRATEGY IMPLEMENTATION MATRIX

Objectives	Outcomes	Strategies	Key performance indicators	Time frame	Actors	Costs (in KSH)
Thematic Area 1: policy, legal and regulatory framework						
Review, Develop and streamline a national E-waste policy, E-waste regulations and EEE standards	<p>Development of sustainable E-waste policy, regulations and EEE standards</p> <p>Revision of the existing legal and regulatory framework with green economy perspective</p>	Revision of the existing legal and regulatory framework with green economy perspective	<p>Number of counties with an E-waste policy, act regulations and EEE standards</p> <p>Number of revised and streamlined legal and regulatory frameworks</p>	2020-2023	<p>C.O.G, ministry of Environment KIPPRA KEPSA Line ministries</p>	25 M
Harmonize county policies, acts, regulations, guidelines and standards to the national, legal and regulatory framework.	Harmonized counties legal, policies and regulatory framework	Establishing a legal framework to comply with Basel Convention obligations;	Number of harmonized policies, acts and regulations aligned with national policies and regulatory framework	2021-2023	<p>C.O.G Lead institutions. KEPSA KIPPRA</p>	15 M
Establish and enforce EPR and ARF principals in the national policy	<p>Development of an incentive framework</p> <p>Provide a management structure and implement a financing mechanism for the</p>	<p>Develop the administrative framework of the third party organizations including the rules that will govern the third party organization</p> <p>Development</p>	<p>Enactment of the EPR and ARF</p> <p>Operationalization of the incentive framework</p>	2022-2024	<p>Lead institutions KEPSA Treasury KAM Line ministries</p>	20 M

	sustainability of the E-waste take-back system	of an EPR and ARF				
Enactment operationalization of the draft environmental management coordination (EEE-waste management) regulations	Publication of the E-waste regulations	Facilitate the adoption and entrenchment of National E-waste regulations.	Enforcement of the E-waste regulation	2019-2030	NEMA Ministry of environment C.O.G	20 M
Thematic Area 2: Public awareness, research and capacity building on E-waste.						
Raise comprehensive awareness about E-waste and its management.	Existence of a comprehensive rollout plan for awareness creation.  Funding of E-waste education and awareness programmes and activities of their own initiative and from obligations imposed by the government	Create and implement awareness and education activities and programmes on the responsible disposal of E-waste	Developing educational and awareness programmes on E-waste disposal methods for consumers jointly with the government	2020-2022	Ministry of environment NEMA KAM KEPSA Ministry of ICT Media	10 M
Develop and disseminate simplified version of the strategy, guidelines, regulations and standards	Rise in proportion of the population with access to the simplified versions material	Development and dissemination of brochures, fliers, pamphlets advertisements etc. on E-waste management	Percentage increase on the materials developed and distributed to the population	2020-2021	Lead institutions KAM NEMA Ministry of environment. Line ministries	25 M

					KEPSA	
Build capacity on E-waste management amongst stakeholders	Rise in awareness on sustainable E-waste management	Development of capacity building programme and schedules for diverse stakeholders	Participation in regional and international fora on the best practices in E-waste management  Increased stakeholders participation in for a	2020-2025	NEMA  Line ministries  Ministry of environment  Ministry of education  KEPSA  KAM C.O.G  Research institutions  Development partners	60 M
Develop education curriculum at all levels of education and encourage research and development on E-waste	Development of a sustainable E-waste management curriculum	Strengthen institutions to enhance adoption of the E-waste management curriculum  Support sustainable E-waste management technologies including business incubation centers	Kenya E-waste management curriculum in place  No. Of training programmes that incorporate sustainable E-waste management  Proportion of centers of excellence championing E-waste management	2020-2030	Ministry of environment  Ministry of education  TSC  KICD development partners  Research institutions	25 M
Sensitize members of the public, private sector players and public institutions inclusive of regulatory authorities on the importance of sustainable E-waste management	Develop a communication and stakeholders engagement strategy  Increase awareness through different means, e.g.,	Design and distribute educational pamphlets that answers what is e-waste, the negative effects of manipulating E-waste on	Creation of quality jobs in the recycling sector while ensuring compliance with technical standards for the protection of the environment and those involved in	2019-2024	Line ministries  C.O.G  Ministry of environment  Lead institutions KAM	

	information on websites, in store billboards, etc., on the risks of mishandling E-waste, e.g., hoarding E-waste products, sending E-waste to the landfill, etc	human health care, ways to dispose E-waste responsibly, etc.	the collection, transportation and processing of E-waste.		KEPSA	30 M
Develop a system of collection of reliable accurate and up to date data on EEE and generated WEEE.	Development of an EEE registry	Conduct a baseline survey on EEE and WEEE in Kenya	Existence of up to date on EEE and WEEE in the country	2020-2023	Ministry of environment KEPSA Research institutions KNBS C.O.G Development partners KEBS	50
Promote compliance of section 165 (2) of the public procurement and disposal act 2015	Increased compliance by public institutions	Reviewing of the PPDA 2015 to address the loopholes	Reduction of E-waste within public institutions	2019-2021	Treasury PPRA Ministry of environment NEMA Lead institutions Line ministries	28 M
Thematic Area 3: infrastructure for E-waste management						
Conduct an E-waste infrastructure analysis	Develop an E-waste management roll out plan	Identify existing infrastructure gaps Description and	Enhancement of existing facilities or set up new facilities at County and national level	2019-2024	C.O.G Development partners Ministry of environment	25M

		assessment of E-waste management practices in the informal and formal sector			Treasury KEPSA KAM NEMA Development partners	
Facilitate the development of dismantling and recovery facilities within the country's regional economic blocks	A rationalized , well distributed and developed E-waste management infrastructure	Develop guidelines on the basic requirements on the establishments of E-waste collection centers and recycling facilities	Put in place appropriate mechanisms for collection, transportation and disposal of E-waste such as the take-back systems with incentives for consumers, door-to-door collection etc	2020-2023	C.O.Gs Development partners Ministry of environment Line ministries architectural association of Kenya (AAK) National construction authority(NCA )	2 Bn
Thematic area 4: Resource mobilization for E-waste management.						
Establishment of a national E-waste fund	Conduct a funding needs assessment at both national and counties level  Engage regional, international organizations and private cooperation's	Develop and streamline funding mechanism for E-waste management within the counties  Conduct a study to determine the EPR and bonds deposit fees	Development of EPR and AR fees guidelines  Establish a phased approach to including EEE into the E-waste management system	2020-2023	Ministry of environment Treasury Development partners Research institutions KEBS KRA	20 M  Donor funding



<p>Conduct a study to determine the EPR and adopt the deposit bonds system</p>	<p>Development of EPR and deposit bonds system guidelines</p>	<p>Provide a management structure and implement a financing mechanism for the sustainability of the E-waste take-back system.</p> <p>Encourage trade-in of electronic and electronic equipment's</p>	<p>Implementation of a national take-back system to collect, process, dismantle, and export E-waste to locations with adequate facilities and tools, such as refineries, to treat E-waste, consistent with Kenya international obligations</p>	<p>2019-2021</p>	<p>Research institutions Line ministries KEPSA Treasury K.A.R.A</p>	<p>90 M</p>
<p>TOTAL. Ksh. 2.445 billion</p>						

## ANNEX 2 NATIONAL E-WASTE COMMITTEE MEMBERS

Special thanks go to the following members of the national E-waste committee.

1. Dr. Ayub Macharia, Interim Chairperson, Ministry of Environment and Forestry, National E-waste Steering Committee
2. Sarah W.N Njau, National E-waste Steering Committee
3. Rodney Omari, Ministry of environment and Forestry
4. Isaiah Maina, Ministry of Environment and Forestry
5. Rachel Kiondo, Communications Authority of Kenya
6. Joshua Patroba, National E-waste Steering Committee/Recykla international
7. Daniel Mututho W, NEMA
8. Godfrey Wafula, NEMA
9. Florence Mwikali John, NEMA
10. Juma Ooro, Communications Authority of Kenya
11. Eric Guantai, National, E-waste Steering Committee/ Recykla International
12. Seth Munyambu, National E-waste steering committee/ Digital Pipeline Africa
13. Margaret Maimba, National E-waste steering committee/ NACOSTI
14. Lois Kimani, National, E-waste Steering Committee /Ministry of Education
15. Dr. Virginia Onyara, National, E-waste Steering Committee / Multi Media University
16. Doreen Alwala, National, E-waste Steering Committee /WEEE Centre
17. Lawrence Thuo, National, E-waste Steering Committee / EWIK
18. John Mwangi, NEMA
19. Michael Koech, National, E-waste Steering Committee/Safaricom
20. Antony Siemento, National, E-waste Steering Committee/Sinomet Kenya LTD
21. Farida Were, National, E-waste Steering Committee/University of Nairobi

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NEMA National Solid Waste Management Strategy, 2015

UNEP, 2010. Sustainable Innovation and Technology Transfer. Industrial Sector Studies. Recycling – From E-waste to Resources. The United Nations and E-waste System-wide Action on Addressing the Full Life-cycle of Electrical and Electronic Equipment, UNEP, Nairobi.