REPUBLIC OF RWANDA





FIVE YEAR NATIONAL E-WASTE STRATEGY

MARCH, 2015

TABLE OF CONTENTS

FORWARD.....2
ACRONYMS AND ABBREVIATIONS.....6
EXECUTIVE SUMMARY.....8

1. BACKGROUND 10
1.1 Introduction 10
1.1.1 Definition of Electrical and Electronic Equipments (EEE).....12
1.1.2 Definition of Waste Electrical and Electronic Waste (WEEE) – E-Waste.....12
1.2 Why the E-Waste Management Strategy for Rwanda?.....13
1.3 Opportunities in E-waste Management in Rwanda.....14
1.4 Objectives of the e-waste strategy.....14
1.4.1 Specific Objectives.....14

2.0 SITUATIONAL ANALYSIS.....16
2.1 The e-waste challenges in Rwanda.....16
2.2 Policy and Legal Framework (National and International).....16
LAW N 50/2008 Of 09/09/2008 Determining The Procedure For Disposal of State Private Assets.....16
2.3 Current practices in e-waste management in Rwanda.....19
2.4 Regulation of EEE at entry points.....21

3.0 POLICIES, LEGISLATION, STANDARDS AND GUIDELINES 20
3.1 Introduction.....22
3.2 ICT and Environmental Policies in Rwanda.....22
3.2.1 The ICT Bill.....22
3.3 Legislation and Regulations in Rwanda Relevant to Waste management 22
3.3.1 The Environment Organic Law N 04/2005 of 08/04/2005.....22
3.3.2 The law N 09/2013 of 01 March 2013 establishing RURA.....22
3.3.3 The law N0 16/2013 - Functioning and Responsibilities of REMA.....22
3.3.4 LAW N 50/2008 OF 09/09/2008 Determining The Procedure For Disposal of State Private Assets.....22
3.4 Applicable International Conventions for E-Waste Management.....23
3.5 Institutional framework for e-waste management in Rwanda.....23

4. ROPOSED STRATEGIC INTERVENTIONS FOR E-WASTE MANAGEMENT.....27
4.1 Introduction.....27
4.1.1 Vision.....27
4.2 Policy Objectives.....27
4.3 Strategic interventions in the e-waste strategy.....27
4.4 Strengthening the legal and institutional framework.....30
4.5 E-waste awareness raising.....30
4.6 Investments in e-waste handling and Treatment infrastructure.....30
4.6.1 Sustainability of the E-waste treatment systems.....32
4.6.2 E-waste collection and storage - Collection centres or drop-off points.....34
4.6.3 E-Waste Transportation.....35
4.6.4 Establishment of an e-waste Treatment facility.....36
4.6.5 Strategies for managing hazardous and/or output components from the Treatment Facility.....37
4.7 Capacity building in e-waste management.....38
4.8 Setting up and functioning of the e-waste fund.....38
4.9 Resource mobilization and Strategic Partnerships.....39
4.10 Setting up a steering committee for management and supervision.....41
4.11 Risks Associated With Non Implementation of This Strategy.....41
4.12 Implementation Log Frame.....43
4.13 Proposed Implementation Framework and Budget.....48

5. MONITORING AND EVALUATION OF E-WASTE STRATEGY.....55

6. REFERENCES.....56

9. ANEXXES.....57
9.1 Methodology.....57
9.2 List of Stakeholders Consulted.....64

LIST OF TABLES

Table 1: Summary of existing national policies and regulations on e-waste and their relevance……14

Table 2: Keystakeholders……21

Table 3: Summary of the strategic areas of intervention, gaps and proposed strategic actions……24

Table 4: Existing and possible downstream market infrastructure in Rwanda for different e-waste fractions generated by Electrical and electronic equipment……31

Table 5: Strategies for managing hazardous output components from the Treatment Facility……35

Table 6: Implementation log frame……42

Table 7: Proposed Implementation Framework and Budget……47

LIST OF FIGURES

Fig.1; The e-waste Categories……11

Fig. 2; An ideal WEEE management cycle (Adopted from SITA DEEE Company, France)……13

Fig.3; Summary of the findings of the survey carried out of EEE and Potential E-waste generated……20

ACRONYMS AND ABBREVIATIONS

ABS: Acrylonitrile Btadiene Styrene
ARF: Advance Recycling Fee
CRT: Cathode Ray Tube
EEE: Electrical and Electronic Equipment
EPR: Extended Producer Responsibility
E-Waste: Electronic Waste
FONERWA: Fund for Environment and Climate Change
FR: Flame Retardant
HIPS: High Impact Polystyrene
IEC: International Electrotechnical Commission OR Information Education and Communication
ICT: Information Communication Technology
ICT4D: Rwanda ICT for Development
ISO: International Organization for Standardization
ITU: International Telecommunication Union
LED: Light Emitting Diode
MINICOM: Ministry of Trade and Industry
MINIFRA: Ministry of Infrastructure
MOH: Ministry of Health
MOE: Ministry of Education
MOU: Memorandum of Understanding
MYICT: Ministry of Youth and ICT
NICI: National Information and Communication Infrastructure Plan
PC: Polycarbonate
PPP: Public Private Partnership
PSF: Private Sector Federation
PVC: Polyvinyl Chloride
RDB: Rwanda Development Board
REB: Rwanda Education Board
REMA: Rwanda Environment Management Authority
RHA: Rwanda Housing Authority
RURA: Rwanda Utilities Regulatory Authority
RRA: Rwanda Revenue Authority
RRECPC: Rwanda Resource Efficient and Cleaner Production Centre
RSB: Rwanda Standards Board
SME: Small and Medium Enterprise
STEP: Solving the e-waste Problem
UNEP: United Nations Environment Program
UNIDO: United Nations Industrial Organization
TVETS: Technical and Vocational Training Schools
WEEE: Waste Electrical and Electronic Equipment

EXECUTIVE SUMMARY

For the last two decades, the technological advancement has led to a great change in the usage of devices by mankind. The devices range from large household and industrial equipments to consumer products. Once these devices cease to have any useful, they need to be discarded. Most of these devices are electrical and electronic equipments (EEE). The waste generated from EEE is commonly referred to as waste electrical and electronic equipment (WEE) or e-waste. This form of waste is normally classified as hazardous and toxic. Thus an appropriate management of this type of waste ensures a safe and healthy environment.

Rwanda being one of the countries where there is a growing demand for Information Communication and Technology especially by government e.g national initiatives like computers for school going children and others that provide e-government services including telemedicine, e-education and e-agriculture among others, the acquisition and use of computers, mobile phones and television sets as well as application and programs that will provide access to many have and are contributing to the growing amount of e-waste in the country.

The most recent inventory survey on EEE and the expected amount of E-waste to be generated that was carried out between November 2014 and January 2015 that mainly focused on about 15 major EEE in Rwanda i.e PCs, PC printers, Mobile phones, Copying machines, Refrigerators, Air conditioners, Televisions, Washing machines, Car batteries, Dry cell batteries, Stabilizers, Electric cooking, stoves, Electric water heating systems, Fluorescent lamps and Radios it was revealed that there is an annual growth in the importation of EEE to Rwanda of about 5.95% (between 2010 and 2014). The survey indicates that Rwanda has an e-waste annual generation potential of 9,7417tons of which 7,677tons (81.52%) will be contributed by individuals, 597tons (6.34%) by private institutions and 1,143tons (12.14%) by public institutions. This potentially generated e-waste's distribution is as follows: (i) Kigali – 3,222tons (34.21%), (ii) Northern Province – 3,512tons (37.29%), (iii) Eastern Province – 877tons (9.31%), Southern Province – 472tons (5.01%) and (iv) Western Province – 1,335tons (14.18%). This clearly indicates that e-waste management needs to be addressed since these generational levels need high capacities of treatment, recycling and refurbishment. And unlike before when most of the e-waste was in the hands of government, the current trend indicates that most of the e-waste belong to individuals who unless incentivized do not easily part with their e-scrap for any form of treatment.

Following these foreseeable challenges being posed by WEEE, the Government of Rwanda decided that an E-waste Policy and a management strategy be designed and implemented soonest before e-waste management becomes a crisis due to its increased volume, limited capacity for managing it in terms of knowledge and appropriate treatment technologies.

To address the overall objective of the strategy which is to provide a comprehensive, multi-approach and all inclusive plan for implementing the e-waste policy, detailing the costs, time frames, targets, outputs and outcomes, this document has been subdivided into five main chapters that highlight different aspects that need to be implemented to ensure an appropriate management of e-waste in a sustainable way.

Chapter 1 gives the background information about e-waste in Rwanda and also spells out the strategic objectives of this strategy which include: to identify and prioritize areas of intervention in the e-waste management so as to minimize the adverse effects of e waste on the environment and human health ; to identify the different stakeholders and their respective roles in e-waste management; to provide for the establishment of an e- waste management treatment facility in order to promote investment and coordination of e-waste management so as to ensure sustainability of e-waste Management in the country ; to provide for awareness and education on e-waste management and finally to mobilize funds, human and technical resources for implementation of the strategy

Chapter 2 gives the situational analysis of e-waste management in the country starting with the current challenges of e-waste management in the country, the legal framework and institutional arrangements and finally highlighting the current practices on e-waste management in the country. One of the key highlights in this chapter is the issue of lack of a law, regulations and technical guidelines on e-waste management. The chapter also identifies the lack of an appropriate facility in the country to manage e-waste.

Chapter 3 details some of the relevant legislations in place and the existing institutional arrangement that guide e-waste management. It is important to note that whereas there is no specific law or regulation on e-waste, the ICT Bill has in its article 130 has given a framework for e-waste management.

Chapter 4 looks at the draft policy objective and how the strategic actions that have been proposed will aid in the operationalisation of the policy. This chapter looks at strategic areas of focus after identifying all the gaps that exist in proper e-waste management in the country. The strategic actions are then identified in each of the strategic areas of focus.

The main strategic areas are: institutional development and coordination of e-waste management in Rwanda; policy, legal and Regulatory framework for e-waste management in Rwanda; awareness raising and capacity building ; infrastructure for e-waste handling and treatment and resource mobilization for implementing the proposed strategic activities for sustainability. It is worthwhile to note that the setting up and management of an e-waste fund is one of the key strategic actions in resource mobilization. This chapter also provides for the log frame matrix for the implementation of the strategy and will be very important during the monitoring and evaluation and the costed work plan for the proposed activities in this strategy, the proposed time frame and responsible institutions to implement the actions.

Chapter 5 explains briefly how the monitoring and evaluation will be undertaken

1. BACKGROUND

1.1 Introduction

Globally, for the last two decades electrical and electronic waste is the largest growing waste stream. This is majorly attributed to the fast growing ICT and the high affinity by most governments, individuals and corporate to upgrade their technological advancements. The lack of legislations on e-waste management, weak and/or no enforcement of any existing legal framework on e-waste and poor or no infrastructure for treating e-waste have immensely contributed to the current situation of poor e-waste management. Currently, the generation levels are alarming in most countries and specifically developing countries as the rush for promotion of technologies is making most of them susceptible to cheap and sub-standard electronic and electrical equipments (EEE) acquisition. The high volumes of e-waste generated and inadequate facilities to manage this type of waste basically means that the e-waste generated mostly end up being discarded in the general waste stream.

Rwanda being one of the countries where there is a growing demand for Information Communication and Technology especially by government e.g national initiatives like computers for school going children and others that provide e-government services including telemedicine, e-education and e-agriculture among others, the acquisition and use of computers, mobile phones and television sets as well as application and programs that will provide access to many have and are contributing to the growing amount of e-waste in the country.

Rwanda aims to achieve middle–income status by 2020 and a developed country by 2050, while also developing a green economy. In line with Vision 2020, the Government of Rwanda integrated ICT as a key driver for socio-economic development by adopting the Rwanda ICT for Development (ICT4D), commonly known as the National Information and Communication Infrastructure Plan (NICI). The NICI plan, which started in 2001, aims at fast tracking Rwanda's transformation to a knowledge-based society. To ensure this is achieved, more acquisition of ICT and EEE has to be done. This in the actual fact means that there is a growing trend of such equipments in the country.

In Rwanda, some of the major categories of electrical and electronic equipments are:

i) ICT Equipments e.g desk top computers, laptops, mobile phones, printers, ipads etc
ii) Large and small household equipments e.g fridges, electric kettles, micro waves, etc

iii) Lighting equipments e.g compact fluorescent tubes etc

iv) Consumer equipments e.g TVs, Radios etc

v) Electrical and electronic tools (with the exception of large-scale stationary industrial tools) e.g sewing machines, drills, saws etc

vi) Toys, leisure and sports equipment e.g the electric toys, gym equipments etc

vii) Medical devices (with the exception of all implanted and infected products) e.g dialysis machines etc

viii) Monitoring and control instruments e.g CCTV cameras

ix) Automatic dispensers e.g water, money etc dispensers

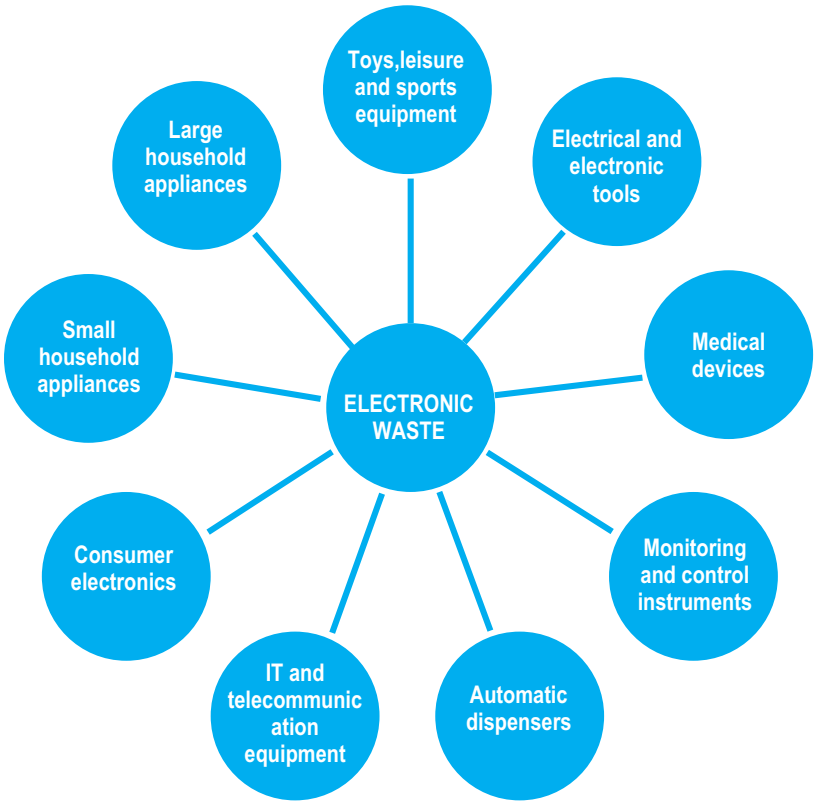


Fig.1; The e-waste Categories

Once these EEE come to their end of life, they need to be discarded (disposed) as they qualify to be waste i.e waste electronic and electrical equipment (WEEE).
During a recent inventory survey on EEE and the expected amount of E-waste to be generated that was carried out between November 2014 and January 2015 that mainly focused on about 15 major EEE in Rwanda i.e PCs, PC printers, Mobile phones, Copying machines, Refrigerators, Air conditioners, Televisions, Washing

machines, Car batteries, Dry cell batteries, Stabilizers, Electric cooking, stoves, Electric water heating systems, Fluorescent lamps and Radios it was revealed that there is an annual growth in the importation of EEE to Rwanda of about 5.95% (between 2010 and 2014). The survey indicates that Rwanda has an e-waste annual generation potential of 9,7417tons of which 7,677tons (81.52%) will be contributed by individuals, 597tons (6.34%) by private institutions and 1,143 tons (12.14%) by public institutions. This potentially generated e-waste's distribution is as follows: (i) Kigali – 3,222tons (34.21%), (ii) Northern Province – 3,512tons (37.29%), (iii) Eastern Province – 877tons (9.31%), Southern Province – 472tons (5.01%) and (iv) Western Province – 1,335tons (14.18%).

Following these foreseeable challenges being posed by WEEE, the Government of Rwanda decided that an E-waste Policy and a management strategy be designed and implemented soonest before e-waste management becomes a crisis due to its increased volume, limited capacity for managing it in terms of knowledge and appropriate treatment technologies

1.1.1 Definition of Electrical and Electronic Equipments (EEE)

EEE (Electrical and Electronic Equipment) is equipment dependent on electric currents or electromagnetic fields for its function and also equipment for the generation, transfer and measurement of such currents and fields. Equipment of both household and industrial usage are included in EEE

1.1.2 Definition of Waste Electrical and Electronic Waste (WEEE) – E-Waste

The EEE has an end of life. Once such equipments reach their end of life, they are usually regarded as waste that needs to be discarded. Thus, E-waste is simply 'discarded EEE'

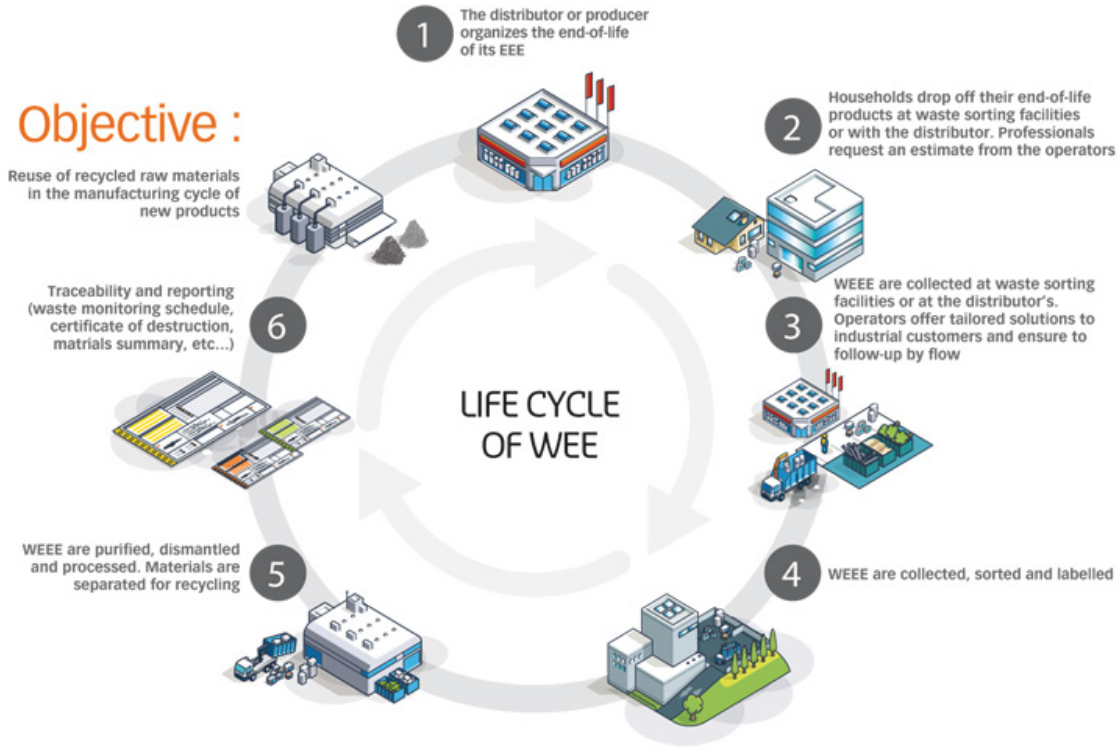


Fig 2. An ideal WEEE management cycle (Adopted from SITA DEEE Company, France)

1.2 Why the E-Waste Management Strategy for Rwanda?

Rwanda is developing this e-waste strategy to overcome some of the challenges that arise from the rapidly growing e-waste stream. The challenges include:

i) Rapidly increasing e-waste volumes from imports of electrical and electronic equipment and domestically generated e-waste

ii) Low level of awareness amongst key stakeholders that include users and consumers of the electronic and electronic equipment on the recommended standards for EEE, the hazardous nature or toxicity of e-waste and effects of incorrect e-waste disposal/ management.

iii) Lack of appropriate infrastructure and technical capacity to handle, treat and dispose e-waste generated along the entire chain from collection, sorting, transportation, reusing, dismantling, treatment, recycling and final disposal

iv) Gaps in existing legal and institutional framework for e-waste management to address the uniqueness of e-waste

v) Existing e-waste recycling and disposal practices are largely informal, with inappropriate techniques applied for treatment and disposal

vi) Lack of incentives for consumers and enterprises to hand out obsolete EEE, or voluntary take back systems for end of life equipment

vii) Lack or of accurate estimates of the quantity of e-waste generated and recycled in to inform e-waste management interventions.

viii) Limited resources in place for e-waste management, and profitable e-waste investments, including financial, human and e - waste handling infrastructure and/or treatment facility.

1.3 Opportunities in E-waste Management in Rwanda

There also exist some opportunities from the e- waste management
i) Job creation through the involvement of youths, women, disabled and any other group by involving them in the collection, transportation and treatment of the e-waste

ii) Development of the capacity (technical, human and infrastructure) will attract more partners and investors in e-waste and also increase business volume as other neighbouring countries will use this developed capacity.

iii) Promotion of the second hand spare parts centres (shops).

iv) Recovery of useful fractions from the e-waste materials

1.4 Objectives of the e-waste strategy

The main objective is to provide a comprehensive, multi-approach and all inclusive plan for implementing the e-waste policy, detailing the costs, time frames, targets, outputs and outcomes.

1.4.1 Specific Objectives

The specific objectives in formulating this strategy are:
i) To identify and prioritize areas of intervention in the e-waste management so as to minimize the adverse effects of e-waste on the environment and human health

ii) To identify the different stakeholders and their respective roles in e-waste management

i) To provide for the establishment of an e- waste management treatment facility in order to promote investment and coordination of e-waste management so as to ensure sustainability of e-waste Management in the country

iii) To provide for awareness and education on e-waste management

iv) To mobilize funds, human and technical resources for implementation of the strategy

v) To establish an implementation and monitoring framework to track implementation progress.

vi) To establish a job creation mechanism along the value chain of e-waste management

2.0 SITUATIONAL ANALYSIS

2.1 The e-waste challenges in Rwanda

The demand for electrical and electronic equipment (EEE) is increasing significantly in Rwanda due to its rapid economic development. This demand is aggravated by the national initiatives to enhance Information and Communication Technologies (ICT) that require varieties of ICT tools such as computers and mobile phones. Additionally, as technology advances and individuals, corporate and the government are eager for the newer technologies, the life span of EEE is progressively decreasing. Consequently, older and outdated products are becoming obsolete and being discarded as e-waste in large quantities and at increasingly alarming rate worldwide.

2.2 Policy and Legal Framework (National and International)

Some of the existing Policies, strategies and legal frameworks that have some linkage with e-waste generation or handling with level of relevance/gaps to e-waste management can be summarized in the table below:

Table 1: Summary of existing national policies and regulations on e-waste and their relevance

Policy/ Regulation	About the Policy/Regulation on e-waste	Gaps to e-waste
The ICT Bill	Article 130 provides a framework for the development of e-waste management regulations Provides an avenue for development of e-waste management regulations	Lack of specific details on e-waste management regulation
Environment & Natural Resources Strategy 2009-2013	Promote environmental education, information and sensitization actions including incorporation of environment in primary, secondary and tertiary education	Lack of awareness raising in e-waste management in schools
Water & Sanitation Strategy 2009-2015	Favourable water resources management principles based on precaution, prevention, 'user-payer and polluter-payer' and charges as per 'contributory capacity of users' principle	Lack of a Polluter pay principle focused on E-Waste contamination
Energy Strategy 2008-2012	Expansion of the energy-mix through the development of new and renewable energy sources Promotion of efficient energy use and management practices including efficient use of alternative energies in industries and services Use of the Clean Development Mechanism to facilitate the development of environmentally sound energy and reduction of emission	Lack of a system to address what will be done with the e-waste that will be generated upon change of technologies

Policy/ Regulation	About the Policy/Regulation on e-waste	Gaps to e-waste
Industry Strategy 2009-2012	Evaluate infrastructure needs of new industries and how they can be combined with existing policy on infrastructure	Lack of a system addressing the aftermath of change in technology that will result in e-waste generation
SME Development Policy 2010	Promote creativity and innovation in the SME sector through schemes that recognize innovation and technology development Introduce appropriate technology demonstration centres within industrial parks for practical training and acquisition of technologies	Lack of a system addressing what will be done with the e-waste that will be generated upon change of technologies
The Environment Organic Law N04/2005 of 08/04/2005	Generally deals with environmental protection and conservation. Also deals with how waste should be managed in the entire chain	Lack of a specificity in the uniqueness of e-waste and its management among the solid waste management
The law N 09/2013 of 01 March 2013 establishing RURA	Deals with the establishment of RURA and how it will manage waste in general Also RURA developed guidelines on minimum requirements for collection, transportation, recycling/treatment and disposal of solid wastes and on management of dumping sites	Lack of a specific mandate on e-waste management
The law N0 16/2013 - Functioning and Responsibilities of REMA	REMA's establishment to deal with the enforcement of environmental protection and conservation	Lack of specificity on e-waste management due to its uniqueness
LAW N 50/2008 of 09/09/2008 Determining The Procedure For Disposal of State Private Assets	Deals with disposal of state private assets by defining the methods of disposing such assets. Part of these assets are e-waste	Lack of direction that the disposal of e-waste should be to licenced actors.

The existing policies, Legal, and Regulatory Frameworks in Rwanda do not sufficiently address e-waste management and its uniqueness as it is considered as a sub-set under the hazardous waste control and management regulations

Thus, it is clearly evident from the current national policies and regulations that e-waste management is not adequately addressed. To ensure that e-waste management is properly entrenched with its uniqueness in the legal framework the following actions are proposed:

a) Fast track the national e-waste policy for adoption

b) Fast track the development and implementation of national e-waste regulations and technical guidelines

c) Review some sections of the LAW N 50/2008 Of 09/09/2008 Determining. The Procedure For Disposal of State Private Assets to direct the disposal of e-waste to authorized facilities that manages e-waste

Rwanda is also a signatory to many agreements and conventions on environmental management. These include support for the provisions of Agenda 21 amongst other declarations and statements of principles, such as the Rio Declaration in 1992 on Environment and Development. Rwanda is also a party to the Basel Convention on the control of trans- boundary movements of hazardous wastes and their disposal.

This strategy has been developed taking into consideration the national and international conventions, which Rwanda is a signatory to such as the Basel Convention so as to ensure the generation of hazardous wastes and other wastes are minimized; adequate disposal facilities exist for sound environmental management of such wastes; and that managers of waste minimize the risk to human health. Similarly, proper e-waste management and treatment would be able to generate new income especially from precious metal recycling businesses and of EEE repair engineers.

The lack of a clear framework for handling and treating e-waste has led to accumulated electronic and electrical waste (e-waste) in offices and warehouses. In most cases, the generated e-waste is mixed with other ordinary waste at homes and dumpsites while most of it especially the ones owned by government agencies are stored within the premises awaiting disposal.

2.3 Current practices in e-waste management in Rwanda

There are growing numbers of personal computers in institutions, households, business facilities etc. The growth of the telecommunication sector in the country has seen the number of citizens subscribing to the mobile network steadily increasing. Moreover, electrical household appliances and equipment are an increasing product group imported to the country.

During a recent inventory survey on EEE and the expected amount of E-waste to be generated that was carried out between November 2014 and January 2015 that mainly focused on about 15 major EEE in Rwanda i.e PCs, PC printers, Mobile phones, Copying machines, Refrigerators, Air conditioners, Televisions, Washing machines, Car batteries, Dry cell batteries, Stabilizers, Electric cooking, stoves, Electric water heating systems, Fluorescent lamps and Radios it was revealed that there is an annual growth in the importation of EEE to Rwanda of about 5.95% (between 2010 and 2014). The survey findings are presented in fig.3

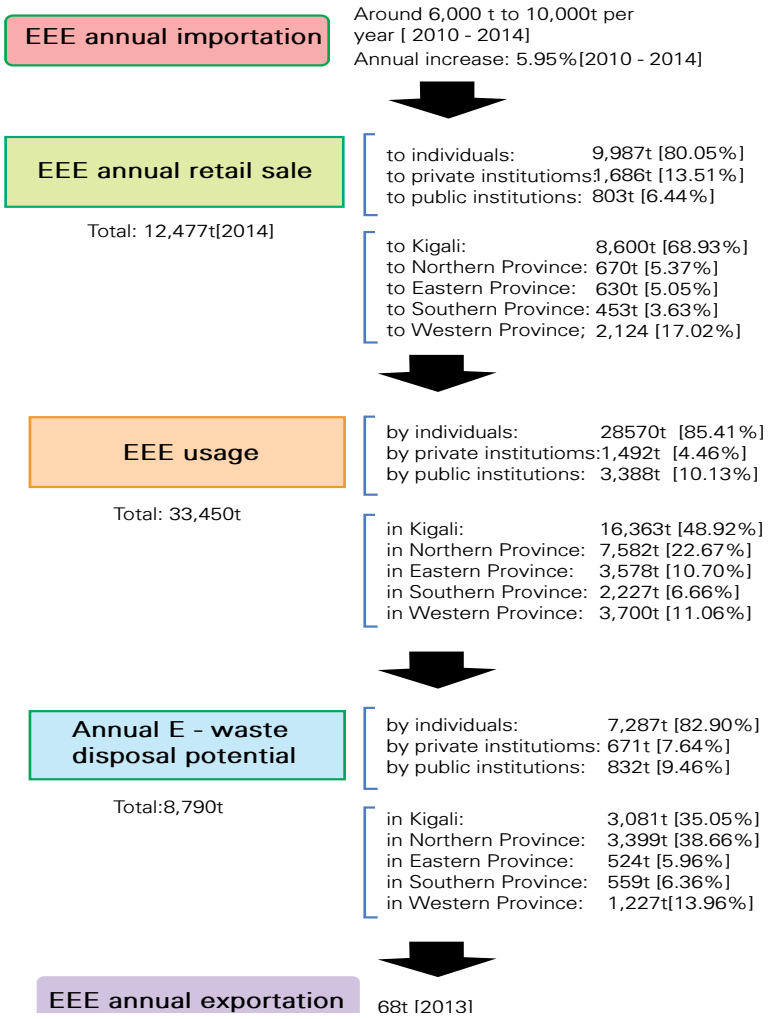


Fig 3. Summary of the findings of the survey carried out of EEE and Potential E-waste generated

The survey indicates that Rwanda has an e-waste annual generation potential of 9,7417tons of which 7,677tons (81.52%) will be contributed by individuals, 597tons (6.34%) by private institutions and 1,143tons (12.14%) by public institutions. This potentially generated e-waste's distribution is as follows: (i) Kigali – 3,222tons (34.21%), (ii) Northern Province – 3,512tons (37.29%), (iii) Eastern Province – 877tons (9.31%), Southern Province – 472tons (5.01%) and (iv) Western Province – 1,335tons (14.18%). This survey clearly indicates that e-waste management needs to be addressed sooner than later since these projected generations need high capacities of refurbishments, recycling and dismantling.

The current lack of e-waste management framework and capacity to handle the e-waste in the country has resulted into institutions and individuals to store outdated equipment or just dispose them with the other waste streams. This mixed waste finally ends up in dumpsites. At such dumpsites, some recovery is done informally by some scavengers while what cannot be recovered is left in the dumpsite thus exposing the environment and humans with the dangers associated with improper disposal of hazardous waste.

The public sector is considered a key contributor of the e-waste and has got accumulations of equipments kept in stores while awaiting a proper management and disposal. The solid waste contractors collect waste from different sectors of the country and transport them to the allocated dumpsites by the municipalities without any distinct segregation of e-waste. It is also worthwhile to mention that currently, there is no approved treatment facility for e-waste in the country

2.4 Regulation of EEE at entry points

In working towards the reduction of e-waste generation in the country, Rwanda Standard Board (RSB) has developed the requirements on importation of EEE. For example, according to The Ministerial Order No:1 of 25/10/2011 related to importation of used electronics/ICT equipments, the following conditions have to be abide by:

- Used electronics are banned for importation into Rwanda
- Used computers imported for education purposes shall meet the provision of article 8, of the Ministerial Order No:1 of25/10/2011,
- Refurbished computers shall meet the provision of article 11, in order to comply by ISO/IEC 24700,
- All computers shall be in compliance with EAS 390:2005

3.0 POLICIES, LEGISLATION, STANDARDS AND GUIDELINES

3.1 Introduction

This chapter provides an overview of the relevant policies, legislation, regulations, standards and guidelines applicable to the management of e-waste in Rwanda, as well as the institutional framework for e-waste management. It also provides proposals for strengthening existing legislation, as well as new regulations and standards for areas where they are weak or lacking.

3.2 ICT and Environmental Policies in Rwanda

3.2.1 The ICT Bill

In its article 130 provides a framework for the development of e-waste management regulations but is at operational level is not sufficient.

3.3 Legislation and Regulations in Rwanda Relevant to Waste management

3.3.1 The Environment Organic Law N° 04/2005 of 08/04/2005

The law determines the modalities of protection, conservation and promotion of environment in Rwanda and it states that collection; transportation; treatment and disposal of waste should be done in an environmentally friendly manner but does not appropriately and specifically address the e-waste management.

3.3.2 The law N° 09/2013 of 01 March 2013 establishing RURA

This law addresses waste management in general but remains silent on handling of e-waste.

3.3.3 The law N0 16/2013 - Functioning and Responsibilities of REMA

This law addresses waste management in general but remains silent on handling of e-waste.

3.3.4 LAW N° 50/2008 OF 09/09/2008 Determining The Procedure For Disposal of State Private Assets

Article 6 on the List of assets to be disposed off states that each year, public institutions with private assets to be disposed of shall prepare a list indicating their state of condition and value. Such a list of assets to be sold, donated, exchanged or destroyed shall be prepared within the same period as the annual budget and transmitted to the Minister supervising the institution, Minister in charge of Finance and Minister in charge of Infrastructure.

In public administration, a list of State private assets to be disposed of shall be approved by Cabinet. With local administrative entities, the list of private assets shall be approved by the District Council. With autonomous Public enterprises, the list of private assets shall be approved by the Board of Directors.

This order in article 12 and 13 gives the methods selling of public private property to include public auction, bidding through sealed envelopes, direct negotiations, exchange and re-selling to the original seller. For the case of e-waste which is considered as hazardous waste, the government cannot sell such a waste to the general public.

3.4 Applicable International Conventions for E-Waste Management

Rwanda is a signatory and has ratified some international conventions and agreements relating to the environment, both regionally and globally. Conventions and agreements of potential relevance to e-waste management that Rwanda has signed are:

i) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989 - The convention seeks to protect human health and the environment against the adverse effects of hazardous wastes through prohibition of hazardous waste that can be transported from one state to another.

ii) The Stockholm Convention 2004 on Persistent Organic Pollutants – The convention seek to protect human health and the environment from persistent organic pollutants

iii) The Rotterdam Convention 1998 – The convention seek to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about heir characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.

3.5 Institutional framework for e-waste management in Rwanda

From the draft policy and the stakeholders' consultation that has been done so far, the following institutions have been found to be strategic partners in the implementation of this strategy.

Table 2: Key stakeholders

Key Stakeholder	Mandate in the e-waste Policy	Role the implementation of the strategy
Ministry of Youth and ICT	Lead the development of e-waste policy and strategic plan for management of e-waste	i) Focal point ministry that oordinate the implementation of the strategy ii) Monitoring the implementation of the strategy
Ministry of Trade and Industry	i) Ensure development of sustainable models for e-waste management such as Public Private Partnerships (PPP) and incentives to attract investments in e-waste handling. ii) Lead the process of establishing e-waste management systems and its sustainable financing mechanisms, such as collection of advanced recycling fees; e-waste levy on communication services among others and its operational and management framework	i) Regulation of trade especially on imports ii) Assist in the resource mobilization iii) Promote the PPP
Ministry of Health	Develop policies that govern health and safety standards on e-waste management.	i) Assist in the monitoring of public health in relation to hazardous waste management ii) Campaign on the dangers of poor management of e-waste
Ministry of Education	i) Lead in the development of curricula regarding e-waste education and awareness. ii) Skill development of local engineers/workers for proper e-waste treatment including its recycling.	i) Development of e-waste curriculum ii) Awareness raising campaigns
Ministry of State Assets	Develop procedure manual and guidelines for disposing the electronic equipment within government institutions considering the sensitivity of information stored in government assets and that they can be repaired and deployed in other sectors like education.	i) Inventory of e-waste in government institutions ii) Inventory of EEE in government institutions iii) Inventory on EEE

Key Stakeholder	Mandate in the e-waste Policy	Role the implementation of the strategy
Rwanda Environmental Management Authority (REMA)	i) Participation in the enforcement of the e-waste policy by providing guidelines for handling and disposal of e-waste. ii) Spearhead the mainstreaming of e-waste into existing Environmental policies and strategies, legal and regulatory instruments. iii) Participate in the informative studies on e-waste such as baseline surveys, etc. iv) Monitor the implementation of environmental programs including E-waste management	i) Promotion of the e -waste guidelines ii) Overseeing the implementation of e-waste regulations
Rwanda Utilities Regulatory Authority (RURA)	Issue regulations and enforce E-waste handling licenses in the country for entities dealing with collection, transportation and recycling of EEE	i) Licencing of all the actors in waste management ii) Assist in e-waste fund resource mobilization
Rwanda Bureau of Standards (RBS)	i) Notify World Trade Organization (WTO) member states on electronic equipment standards set, policies and regulations developed that affect quality of imports into the country, ii) Develop standards concerning e-waste. iii) Develop a mechanism to audit and monitor compliance of electronic and electronic equipment with set standards,	i) Development of the e-waste standards ii) Enforcement of the e-waste standards
Import Inspection Authority	Enforce compliance of all imported electric and electronic equipment with set standards at the Point of Entry	i) Enforcement of the EEE set standards to avoid importation of e-waste
Rwanda Revenue Authority (RRA)	Maintain statistical records of imported electric and electronic imports.	i) Advice on revenue collection geared towards the e-waste fund
Rwanda Development Board	i) Registration of e-waste actors ii) Procurement of ICT equipments for government	i) Promotion of bulk leasing ii) Registration of e-waste actors
Private Sector	Take up the opportunity of the enabling and conducive policy and legal framework to invest and create business as well as employment around e-waste management.	i) Promotion of PPP ii) Investment in e-waste management iii) Resource mobilization towards e-waste fund
Academic Institutions e.g Universities, Technical Colleges etc	To mainstream the developed curriculum and promote capacity through awareness creation and technical competences of engineers, technicians etc	i) Promote awareness ii) Capacity building of technicians, engineers etc

4. PROPOSED STRATEGIC INTERVENTIONS FOR E-WASTE MANAGEMENT

4.1 Introduction

This strategy links the E-waste Policy's Vision and objectives. It is meant to action the good intentions of the policy.

4.1.1 Vision

To ensure the effective and efficient management of e-waste for a safe environment and healthy nation in addition to its contribution to sustainable economic development

4.2 Policy Objectives

The objectives of the Policy are:

ii) To minimize the adverse effects of e-waste on the environment and human health through appropriate legal and regulatory framework for e-waste management

iii) To promote investment and coordination of e-waste management to ensure sustainability of e-waste Management in Rwanda

iv) To develop capacity of stakeholders to promote effective e-waste management investment education and awareness, to empower communities on how to safely handle e-waste

4.3 Strategic interventions in the e-waste strategy

Based on the situational analysis, stakeholder consultations, literature reviewed and documentation on good practices in e-waste management, the strategic areas for action have been identified on the basis of the gaps that exist. The proposed strategic interventions which have been proposed in e-waste management in Rwanda can be summarized in the following table:

Table 3: Summary of the strategic areas of intervention, gaps and proposed strategic action

Strategic Area of Focus	Gaps identified in E-waste management in Rwanda	Strategic Interventions	Strategic Actions
Infrastructure for E-waste handling and treatment	i) Lack of appropriate infrastructure for E-waste handling and treatment ii) Inappropriate E-waste handling and treatment in the informal sector	Set-up of environmentally friendly systems for E-waste handling and treatment	i) Conduct e-waste inventory so as to determine mass flows to inform on e-waste management interventions ii) Establish and maintain a data base for imported and exported EEE iii) Initiate and implement appropriate mechanisms for collection and transportation of e-waste iv) Establish appropriate e-waste collection centres v) Promote take back systems with incentives for consumers vi) Promote EEE leasing for bulk consumers vii) Set up national modern dismantling and recovery facility
Resource Mobilization	i) Lack of streamlined funding mechanism for e-waste management ii) Lack of producer/retailer association	Set up an e-waste Funding mechanism and management system	i) Engage EEE producers/retailers in strategic partnerships including financing the ewaste collection, transportation and treatment through the extended producer responsibility and advanced recycling fee ii) Set up an ewaste fund under the Fund for environment and climate change or RURA which will collect EPR fees, registration fee, licensing fee, individual and corporate contributions etc iii) Facilitate the set up of the extended producer/retailer responsible association under PSF – ICT Chamber iv) Mobilise funds for e-waste management from regional and international organisations such as UNIDO, ITU, STEP, UNEP etc v) Define the e-waste fund management mechanism and the criteria for accessing the fund

Strategic Area of Focus	Gaps identified in E-waste management in Rwanda	Strategic Interventions	Strategic Actions
Institutional development and coordination of E-waste management in Rwanda	i) Need for stakeholder coordination is in order to ensure that e-waste is managed jointly with other line ministries and institutions like Ministry of MYICT, Ministry of Trade and Industries, Ministry of Natural resources, Ministry of Infrastructure, etc ii) Need for supervision and Monitoring of E-waste management activities in Rwanda iii) Need for a model centre that will act as a platform for sensitization, facility management, consultations and engagement among key institutions and stakeholders	Set up an E-waste steering committee to oversee all e-waste management issues for smooth implementation of the E-waste five strategy in Rwanda	i) Set up a steering committee chaired by the Ministry of Youth and ICT, co chaired by the Ministry of Natural resources and the Ministry of Trade and Industry and having members hip representing key implementing agencies (REMA, RURA, REB, RDB,RHA, RBS and PSF) with the aim of fast tracking implementation of this strategy, ii) Enhance communication and coordination among all stakeholders by sharing experience and knowledge on E-waste management iii) Engage with stakeholders within Government, academia and the private sector with the aim of encouraging them to mainstream e-waste management within their policies, work plans and budgets iv) Conduct a participatory monitoring and evaluation framework v) Establish an e-waste centre with a PPP management framework

4.4 Strengthening the legal and institutional framework

Table 1 highlights some gaps in the legal framework including inadequacy in addressing the uniqueness of e-waste. Some issues that are clearly highlighted in the situation analysis and during the stakeholders' consultation include the need to fast track the adoption of the draft e-waste policy and the need for separate e-waste law, regulations, standards and technical guidelines for e-waste management and their enforcement. Some of the existing laws especially the procedure for disposal of state private assets do not address the uniqueness of e-waste.
To achieve this, some strategic actions have been proposed which include: development and dissemination of an an e-waste law and regulations to cater for the uniqueness of e-waste and its management challenges; reviewing procedures for disposal of state private assets to consider the uniqueness of e-waste; development and dissemination of the technical guidelines for e-waste management; development, dissemination and enforcement of standards for EEE imported into the country and registration and issuence of licences to regulate the activities of e-waste collectors, transporters and owners of recovery, dismantling and disposal facilities

4.5 E-waste awareness raising

In most of the consultative meetings held, low awareness levels of e-waste and its hazards have been exhibited. For the proposed activities in this strategy to be implemented effectively, the awareness levels on the need to embrace proper e-waste management must be raised.

To achieve this, some of the actions that have been proposed include: undertake an e-waste awareness campaigns in all districts and provinces targeting the general public, technical staff and local leaders; provision of training for e-waste scheme operators; development of information, education and communication (IEC) packages for each stakeholder category; promoting networking with partner organizations through stakeholder meetings and dialogues; engagement of producers/retailers of EEE to participate in e-waste awareness campaigns; mainstreaming e-waste issues in educational curriculum at various levels especially in TVETs schools and participating in regional and international fora on best e-waste management practices

4.6 Investments in e-waste handling and Treatment infrastructure

The situational analysis section 2 highlights the lack of infrastructure, inadequate knowledge and skills in e-waste handling, as well as the existing informal systems of handling e-waste. Proper e-waste management requires a value chain of all actors who are systematically organized and properly equipped with appropriate tools.

The entire value chain from collection, storage, transportation, refurbishment/ recycling, and dismantling/treatment facility, require investments.

Based on the survey that Rwanda has an e-waste annual generation potential of 9,7417tons of which 7,677tons (81.52%) will be contributed by individuals, 597tons (6.34%) by private institutions and 1,143tons (12.14%) by public institutions. This potentially generated e-waste's distribution is as follows: (i) Kigali – 3,222tons (34.21%), (ii) Northern Province – 3,512tons (37.29%), (iii) Eastern Province – 877tons (9.31%), Southern Province – 472tons (5.01%) and (iv) Western Province – 1,335tons (14.18%), then there is a need to implement business models that will ensure maximum collection and treatment of the generated e-waste.

Some Scenerios Based on Inventory Survey

On the basis of the above data, the number of collection centres, transporting trucks, recyclers, refurbishers and dimantling facilities can be projected for each region and the country

a) On collection centres and transportation

If the following assumptions are made:

Assumption 1: Each Designed truck to carry 10tons per trip

Assumption 2: The projected generations remain constant

Assumption 3: The collection Centres have the same storage/handling capacity

Assumption 4: The number of working/operational days for collection to be 20 days a month

This basically implies:

Area and Projected Tonnage	No. of Trips / Month of 10ton Load	Proposed no. of appropriately designed trucks	Projected Frequency of collection
Kigali - 3081	26	2	6.5 times in 10 days
Nothern - 3399	28	2	7 times in 10 days
Eastern - 524	4	1	1 after every 5 days
Southern - 559	5	1	1 after every 4 days
Western – 1,227	10	1	1 after 2 days

i) that the Nothern Province and Kigali City are viable investment locations

ii) That it is possible to have only 1collection centre per area and operarate effectively

iii) That the Nothern province and Kigali City can each have atleast 2 appropriately designed vehicle to collect the e-waste sufficiently

b) On treatment facility

The projected e-waste generation of 8,790tons/year will require a treatment facility that can handle 732.5 tons/month assumming:

Assumption 1: That all the e-waste generated is challened in this facility

Assumption 2: The treatment facility will be the only one without any other recycler of refurbisher or dismantler

Assumption 3: There will be 100% collection

But from the proposed treatment facility by MINICOM, the installed capacity will handle 1000 tons/ year which is way below the projected generational levels. To ensure the projected e-waste is managed effectively:

i) MINICOM to increase the capacity of the proposed treatment plant to atleast 200 tons/month

ii) More investors to consider investing in more e-waste treatment facilities

iii) Increase the level of recycling and refurbishment

4.6.1 Sustainability of the E-waste treatment systems

Electronic wastes contain toxic substances such as lead, mercury, cadmium, lithium, etc. These toxic materials can be released upon disposal, posing a threat to human health and the environment. Inconsistencies in worker safety and environmental protection mean potential liability concerns for those sending E-waste to dismantling facilities. However, electronic wastes also contain precious metals such as gold, silver, which offer opportunities for economic extraction. For example, precious metals contribute well over 70% of all metals related value in cell phones, calculators and printed circuit board scraps. In other items such as TV boards, and DVD players they still contribute about 40% of the value.

The enforcement of regulations/ E-waste law in Rwanda that will require producers/ retailers to pay for the cost of the 'end of life' treatment of electrical and electronic equipment (trough Producer Responsibility association)., It is estimate that contribution will be 100 million Rwf each year. Producers have considerable experience in e-waste recycling. Hewlett Packard has been recycling most of its products through a number of schemes in the last 20 years. Nokia and Motorola have launched EPR initiatives through voluntary take-back schemes in developing countries.

Rwanda can benefit from the similar EPR initiatives and recycling programs from industry players like HP, Microsoft, IBM, Acer, Dell, Huawei, Sony and Samsung.

The government has to seek avenues for partnerships where producers set up take back programs for old or end of life equipment like printers, computers, toner cartridges, mobile phones and batteries through their certified agents or third party entities or provide assistance in ensuring sustained management of the e - waste, or even set up refurbishment facilities. In addition , partnerships are can be sought with system operators, particularly Telecommunications companies to have in place take back schemes for the equipment they sell through promotions and normal sales like mobile and fixed phones, modems, switches, routers, radio links such as MTN, TIGO, AIRTEL, etc.

Another source of income for the sustainability of e-waste management systems will be through selling valuable materials in E-waste.

Table 4 Existing and possible downstream market infrastructure in Rwanda for different e-waste fractions generated by Electrical and electronic equipment.

Material fraction	Recycling / disposal in Rwanda	Possible downstream partners	Strategic Actions
Plastic	Partially	Plastic recyclers	Currently thrown away in dumpsites or burnt. Burning creates health risks due to releases of furans and dioxins Needs investments for upgrading the local recyclers Rwanda Plastic Industry has shown an interest for the plastic fractions from E-waste. Selling Plastic fractions will generate incomes
Ferrous metals	Yes	Steel rolling mills and foundries e.g. SteelRwa, Mastersteel	Selling the fraction generates income
Aluminium	Yes	Aluminium smelters	Selling the fraction generates income
Aluminium	Yes	Metal smelters, e.g. SteelRwa	Recovery of copper from cables is done in a crude way. Cables are burned or peeled off with sharp tool such as knives to recover copper Selling the fraction generates income Exporting bears the danger of stimulating copper robbery
Copper	Yes	Metal smelters, e.g. SteelRwa	Recovery of copper from cables is done in a crude way. Cables are burned or peeled off with sharp tool such as knives to recover copper Selling the fraction generates income Exporting bears the danger of stimulating copper robbery

Material fraction	Recycling / disposal in Rwanda	Possible downstream partners	Strategic Actions
Printed wiring boards (PWB containing precious metals)	No	Not available in Rwanda, export to Europe or Asia.	Sale of these fraction to a global refinery could generate income
CRT tubes (incl. glass, containing lead, beryllium, phosphor, etc.)	No	So far not identified in Rwabda Export to Europe	Sale of these fraction to a global refinery could generate income
Hazardous fraction (PCB in capacitors, mercury in backlights, batteries)	No	Batteries will be sold to the batterie recycling company in SEZ Rwanda	Needs either investment into a local hazardous waste treatment facility or needs to be exported to specialized facilities abroad (e.g. to Europe)

To ensure sustainability of investing in a proper waste handling system and treatment facility, some actions have been proposed which include: concluding on the on going exercise of an e-waste inventory so as to determine mass flows and inform on e-waste management interventions; establishment and maintainance of a data base for imported and exported EEE, initiating and implementing appropriate mechanisms for collection and transportation of e-waste; establishment of appropriate e-waste collection centres; promotion of take- back systems with incentives for consumers and promotion of EEE leasing for bulk consumers.

4.6.2 E-waste collection and storage - Collection centres or drop-off points

To achieve a good level of collection, a combination of strategies must be employed including that of retailer/producer take back systems, e-waste collection schemes in all provinces, special collection centres or drop off points amongst others. The proposed collection mechanism meant to initiate collection centres or drop-off points where consumers and businesses can leave e-waste will be established at locations that are easily accessed by those wishing to dispose of their electronic waste. The collection will have in place MoUs with producers or retailers for drop off points at their premises and these centres could be managed and controlled through a collection scheme or producer responsible organization or by a third party association of informal collectors of e-waste, but with approval and regulation of, or in partnership with the relevant authority. A number of labelled sorting containers will be provided according to product type at the centre to ensure that the waste is segregated.

All that is collected is proposed to feed into the national e-waste collection system.

E-waste collectors and transporters should be licensed and regulated. The collectors should have approved sites or facilities where the sorting, recovery, treatment and even recycling takes place. Alternatively the registered e-waste collectors will deliver to approved collection centres, or become agents to operators of recycling facilities.
For the large producers, including system operators, importers, retailers, government and private institutions, corporate community, workshops, there should be an obligation to be part of a scheme collecting their e-waste, or an authorised agent to pick up their e-waste.

Areas of disposal should be those approved by the relevant authorities.
The producers should cater for the costs of collection, treatment, recovery and appropriate disposal of this e-waste. Targets should be set for each producer or scheme operator in terms of e-waste collection, and records kept of EEE put to the market and e-waste collected. Collection targets will be established based on the e-waste inventories and mass flows assessments.
For the household levels, the conceptual approach that will sustain the collection system is to provide incentives for consumers to bring their electronic waste to drop off points, collection points or centres.

Incentives can include reduced prices on new equipment when old ones are taken back; the old equipment should be bought at a fee as an incentive to the owners to deliver to collectors. The scrap metal and plastic waste recycling industries are riding on this concept and have achieved good collection efficiencies. Raising awareness of e-waste collection systems initiated amongst consumers and the general population is a key contributing factor that will determine the success.

Another incentive could be free provision of space for e-waste collection and recycling within regional industrial parks. Guidelines should be developed with technical specifications and other requirements for the establishment of collection centres and transportation. This will be provided for in the technical guidelines.

4.6.3 E-Waste Transportation

The e-waste collected in all points shall be transported in trucks or vehicles that are fully closed as per to the requirements spelt out in the technical guidelines. The transporter should be licenced as per to the regulations and should strictly adhere to the terms spelt out in the e-waste transportation rules and procedures.

The collection and transportation of collected e-waste shall be carried out in a way, which optimizes reuse and recycling of those components or whole appliances that are capable of being reused or recycled. In addition collection and transport should minimize damage to the equipment.

The MYICT and regulators should have MoUs in place with large producers, retailers, telecom operators to have e-waste collected and transported to the treatment facility.

4.6.4 Establishment of an e-waste Treatment facility

A strategically located e-waste treatment facility should be established to provide a secure and environmentally conscious solution for the sorting and segregation of e-waste into reusable streams. Collections from the channels above – listed in 4.6.1, will be taken to the treatment facility. Technical specifications and other requirements for the establishment of the facility will be provided for in the e-waste management regulations. In addition guidelines for dismantling and recovery will be provided for in a technical manual. Workers involved will be trained in required knowledge and skills. In the short term, the activities will be mainly manual. Manual sorting is low capital cost initiative, where valuable fractions/components will be recovered, efficient sorting of fractions can be achieved.

It is labour intensive thus job creation is assured.

Manual labour and simple tools like screw drivers, crimpers, pliers, cutters and stripper tools will be used to undertake non-destructive disassembly of the components. Manual disassembly will achieve relatively high liberation rates without breaking the original form of components and materials, which is easier to sort and improves reusability while at the same time providing employment opportunities for those engaged in the dismantling process.

At the treatment facility a pre-sort will be done to categorize the waste by type. Pre-inspection prior to dismantling will be done to identify whether equipment is operational in which case it will be cleaned and returned for reuse. If not operational but repairable they will be re-furbished for reuse or sold as refurbished equipment. If neither operational nor repairable, they will be dismantled. The principle of dismantling is to ensure that hazardous and excess materials are removed and disposed of safely, while the recyclable materials are recovered.

A business plan for the operations of the treatment facility has been proposed and discussed by all relevant stakeholders with the government already setting aside funds to establish the facility. Participation of the private sector in promoting the activities of this facility has also been discussed. Partnership with original equipment manufacturers in setting up the facility is proposed in the context of the extended producer responsibility whereas sourcing of a future private partner in operating this e-waste facility should follow the established PPP guidelines.

Due to the limited access to capital intensive technologies like shredding machines and state of the art separation using eddy currents, magnetic and density separation, and the need to enhance employment opportunities, manual dismantling is a feasible option in the short-term

The Ministry of Trade and Industry will however explore various technology options of e-waste treatment and recovery available on the market through benchmarking practices elsewhere.

The approach to be adopted is to collect, sort, decontaminate, dismantle and recover whatever can be reused or recycled locally. Whatever cannot be reused/recycled locally, but has market elsewhere is to be appropriately collected until when feasible volumes required are obtained and exported to industrialized countries where more optimal technical, environmental and economic outcome could be achieved through end-processing to recover trace elements like gold, mercury, sliver, palladium and platinum.

The Ministry of Trade and Industry, and lead agencies will support the facility management in identifying partners to whom to export components that cannot be handled locally.

4.6.5 Strategies for managing hazardous and/or output components from the Treatment Facility

The strategies for managing hazardous and/or output components from treatment facility can be summarized in the table below:

Table 5: Strategies for managing hazardous output components from the Treatment Facility

Component	Strategies for managing
Batteries	These include alkaline batteries, nickel-cadmium rechargeable batteries, lithium-ion batteries, and lead acid batteries. Lead acid batteries can be recycled locally while other types of batteries will have to be shipped out or taken to approved hazardous waste handling facilities
Metals	• Metals including steel, iron, aluminium, and copper, can be recycled in the country and have demand by local smelters thus segregation streams of metals will help in supporting the local metallurgical industry • Other metals like brass, zinc and titanium portions that might not have local demand could be collected and exported to other countries.
Plastics	• Plastics make up about 17% of electronics. Thermoset plastics like ABS (Acrylonitrile Butadiene Styrene), PVC (polyvinyl chloride), PC (polycarbonate), HIPS (High impact polystyrene) and blends of ABS/PVC, PC/ABS form the biggest percentages. Since there is no plastic manufacturing or recycling company in the country, the recovered plastics can be shipped out to neighbouring countries • The emergence of technologies that enable to separate plastics with flame retardants (FRs) from those without, and those that enable direct use of recovered plastics that contain flame retardants into products that meet strict fire safety standards could provide an option of exporting shredded flakes as raw materials to feed into these recycling operations in America, Europe and Asia. For example in China recycled ABS is being used in the production of camera casing, battery boxes and compact disc trays • Controlled energy generation and recovery where direct combustion of plastics in cement kilns or in energy recovery systems for production of power, hot water or steam, and land filling of shredded plastic flakes in hazardous waste landfills that meet environmental requirements
Printed wire/circuit boards	• The wide spectrum of materials contained in boards demands diverse and separate treatment processes and considerable investment in advanced technologies (especially metallurgical recovery) is required to reach high recovery rate and low environmental impact. This may not be possible given the capital costs and required economics of scale. MINICOM together with lead agencies will support the private sector to identify companies with technical know-how, and sufficient economies of scale to whom these valuable components can be exported. Examples are Umicore Precious Metal Refining in Belgium, Aurubis AG in Germany, Boliden in Sweden, DOWA in Japan and Xstrata in Canada. Thus the circuit boards will be collected in significant quantities and exported for component recovery. • It is also important to note that locally, most of the equipments become unusable due to poor diagnosis of the equipments by repairers in the informal sector especially on the circuit boards. This coupled with the rapid change in technology e.g CRT to flat screens and/or LEDs create a challenge in repairs. This in itself leads to creation of more e-waste. To reduce on this, the government with other private partners can:

Component	Strategies for managing
Printed wire/circuit boards	• The wide spectrum of materials contained in boards demands diverse and separate treatment processes and considerable investment in advanced technologies (especially metallurgical recovery) is required to reach high recovery rate and low environmental impact. This may not be possible given the capital costs and required economics of scale. MINICOM together with lead agencies will support the private sector to identify companies with technical know-how, and sufficient economies of scale to whom these valuable components can be exported. Examples are Umicore Precious Metal Refining in Belgium, Aurubis AG in Germany, Boliden in Sweden, DOWA in Japan and Xstrata in Canada. Thus the circuit boards will be collected in significant quantities and exported for component recovery. • It is also important to note that locally, most of the equipments become unusable due to poor diagnosis of the equipments by repairers in the informal sector especially on the circuit boards. This coupled with the rapid change in technology e.g CRT to flat screens and/or LEDs create a challenge in repairs. This in itself leads to creation of more e-waste. To reduce on this, the government with other private partners can: i) Recommend training and retraining of technicians on new technologies ii) Provide diagnostic machines/equipments to the technicians iii) Set up a second hand shopping mall for spare parts recovered from e-waste materials that are re-usable especially from the circuit boards
Cathode Ray tubes (CRT) - containing lead, beryllium, phosphorus	CRT monitors and TVs contain an average of 1.8 kg of lead and cadmium each and these need to be handled carefully and separately. This e-waste strategy proposes to explore the options of forming strategic partnerships targeting e-waste with international recyclers of CRTs that can guarantee safe disposal.
Hazardous fraction (PCB in capacitors, florescent lights, batteries)	The parts that are identified to have no secondary value or are hazardous shall be disposed off either by controlled incineration or disposed off in underground landfill (designated burial) sites that have leachate control

4.7 Capacity building in e-waste management

Mainstreaming of e-waste issues in the curriculum especially in technical institutions is proposed. The proposed training modules are to cover technical maintenance, dismantling, sustainable e-waste management, and public health. Training will be done for those in e-waste industry (both informal and formal) to equip them with required knowledge and skills, and avoid health and environmental risks. Local entrepreneurs will also be trained on e-waste business opportunities.

Training will also be done to strengthen existing capacity of lead agencies involved in e-waste regulation. Agencies like REMA, RBS, RURA, RDB, local and provincial authorities will be trained in e-waste programs tailored to their sectors.

4.8 Setting up and functioning of the e-waste fund

The government of Rwanda has established the fund for Environment and Climate Change (FONERWA) to be the engine of green growth in Rwanda by mobilizing and channeling domestic and international financing to public and private environment and climate change projects. The green fund will support projects that align with the country's commitment to a strong and prosperous green economy including the sustainable e-waste management.

Therefore, it is important to have a clear framework addressing the emerging issue of e-waste management and ensures its sustainability.

The e-waste fund is proposed to be anchored in FONERWA. All funds collected and any contributions geared towards e-waste management activities should be anchored in an e-waste fund account within FONERWA fund management system.

The e-waste fund will be expected to serve the following purposes:

i) Contributions to PPP schemes, particularly in setting up a modern e-waste recycling facility, and setting up regional collection centres;

ii) Support to SMEs engaged in e-waste collection and recycling

iii) Education and awareness campaigns on e-waste management

iv) Capacity building in government institutions for e-waste management

v) Supporting research initiatives in e-waste management.

The proposal is that initially this fund will be allowed to grow for the first 3 years since the government has funded the activities for the 3 years. The e-waste steering committee will then receive applications from players in the e-waste management chain for priority investments or activities.

4.9 Resource mobilization and Strategic Partnerships

The current situation in the country in regard to funding activities geared towards proper e-waste management is that there is lack of streamlined funding mechanism for e-waste management and ther are no producer/retailer association. E-waste being an emerging issue and seeing the need for managing e-waste, the government has set aside funds to cater for setting up of the capacity building initiatives, setting up a treatment facility, e-waste collection incentives and baseline survey studies including the preparation of the inventory, development of guidelines and preparation of the 5 year strategy. However, these seed funds will only be available for 3 years hence the need to allocate more funds to help set up the structure for to enable the steering committee meant to coordinate the activities for the 5 years and achieve some milestones set up in this strategy.

Establishing and operationalizing an e-waste fund will be a medium term measure to ensure sustainable financing of e-waste management. Other sources of funding for implementation of this e-waste strategy include development partners with interest in greening the e-waste chain.

All possible avenues should be explored to ensure e-waste is collected is properly disposed.

The sustainability of the funding mechanisms and systems is key to ensuring that the activities proposed in this strategy go beyond the 5 years for proper e-waste management in the country and to achieve this, the other actions that have been proposed include engage EEE producers/retailers in strategic partnerships including financing the e-waste collection, transportation and treatment through the extended producer responsibility and advanced recycling fee and setting up an e-waste fund under the Fund for environment and climate change or RURA which will collect EPR fees, registration fee, licensing fee, individual and corporate contributions etc

Producers have considerable experience in e-waste recycling. Hewlett Packard has been recycling most of its products through a number of schemes in the last 20 years. Nokia and Motorola have launched EPR initiatives through voluntary take-back schemes in developing countries. Rwanda can benefit from the similar EPR initiatives and recycling programs from industry players like HP, Microsoft, IBM, Acer, Dell, Huawei, Sony and Samsung. The government has to seek avenues for partnerships where producers set up take back programs for old or end of life equipment like printers, computers, toner cartridges, mobile phones and batteries through their certified agents or third party entities or provide assistance in ensuring sustained management of the e - waste, or even set up refurbishment facilities.

Locally, partnerships are can be sought with system operators, particularly Telecommunications companies to have in place take back schemes for the equipment they sell through promotions and normal sales like mobile and fixed phones, modems, switches, routers, radio links.

A pilot project should be initiated and designed for collection and transportation system, segregation, repair, refurbishment and recycling of e-wastes to demonstrate viability before rolling it out on a wider scale. The project model chosen will explore the opportunities in e - waste management while at the same time addressing its hazardous and toxic ratios.

4.10 Setting up a steering committee for management and supervision

During stakeholder consultations it was noted that currently, e-waste management activities in the country is being done through a sector working group. To ensure an effective and sustainable management of e-waste there is need to set up a steering committee chaired by the Ministry of Youth and ICT, co - chaired by the Ministry of Natural resources and the Ministry of Trade and Industry and having members representing key implementing agencies (REMA, RURA, REB, RDB,RHA, RBS and PSF) with the aim of fast tracking implementation of this strategy.

The management can be effective if a steering committee is formed with an effective chair and other committee officials and members. The steering committee is meant to coordinate all activities that are geared towards enhancing proper management of e-waste in Rwanda.

The committee should have a clear roadmap on how to ensure the proposed actions in this strategy are implemented. Amongst the activities they will undertake in coordination include: awareness campaigns to stakeholders, engagement of all stakeholders, coordinating the e-waste inventory survey, setting up of the e-waste fund, setting up of the dismantling facility on a PPP model, monitoring and evaluation, etc

4.11 Risks Associated With Non Implementation of This Strategy

This 5 year National strategy identifies the key challenges of e-waste management in Rwanda and at the same time highlights what needs to be done to address this situation. Thus there is need to implement the proposed strategic actions within the proposed time frame.

In the event this strategy is not implemented, then the following critical areas of national good and population will be at risks:

1. Policy, institutional and Legal Framework - The lack of appropriate policy, legal and institution arrangements have led to the current situation of poor management of e-waste. The proposed actions on policy, legal and institutional arrangements in this strategy if not implemented will lead to:

a) Lack E-waste Law, Regulations, Policy and Technical guidelines that take into consideration the uniqueness of e-waste amongst the waste streams.

b) Continued dumping of sub standard EEE and e-waste in the country

c) Poor investment climate in e-waste management. Leads to unattractiveness of investors

d) Increase in the number of unauthorized dumpsites in the country

2. Environmental Degradation - Pollution (air, water, soil etc) of the environment leads to environmental degradation. The pollutants contained in e-waste are mostly hazardous and toxic.
Thus if the actions outlined in this strategy will not be implemented then:

a) Most of the e-waste pollutants are persistent organic pollutants that can move and stay long in the soils, water or air. They are toxic and harmful to both humans and environment

b) Destruction through contamination of important resources like water and land and this in turn will reduce their availability (scarcity).

c) Depletion of the ozone leading to climatic changes

3. Social Economic losses – The strategy has outlined some of the benefits of proper e-waste management that will be lost if the strategy is not implemented.

They include:
a) Loss of revenue to individuals and government through taxes

b) Loss of jobs thus unemployment levels in the country increases

c) Increase in the amount of money spent on the health sector due to the poor e-waste management related health complication

d) Increased cases of the population with health complications associated with the toxic and hazardous nature of e-waste

4. Health and Safety Risks – Appropriate e-waste management has been highlighted in the strategy to ensure a health and safe environment. Strategic actions have been highlighted for the entire value chain in collection, transportation and treatment of the e-waste fractions. If some of the actions proposed will not be implemented, then:

a) There will be an increased number of people who will loose their lives due to exposure to toxic substances in the e-scrap

b) Emerging health complications associated with exposure to toxic substances

4.12 Implementation Log Frame

The strategic areas for intervention that were indentified have been used to develop a log frame which is important for following up on the implementation of this strategy.***Table 6: Implementation log frame.***

HIERACHY OF INTERVENTIONS	KEY PERFORMANCE INDICATORS	BASELINE	TARGET	MILESTONE	MEANS ON VERIFICATION	CRITICAL ASSUMPTION
Strategic area of intervention 1: *: Policy, Legal and Regulatory framework for E*						
Outcome 1 : Policy, legal and regulatory frame-work for e-waste management in Rwanda devloped	Availability of approved e-waste policy and strategy	Draft policy	E-waste policy and strategy approved by the cabinet	E-waste policy and strategy		Continued Political Goodwill
	Availability of approved e-waste law	Draft law	E-waste law approved by parliament	E-waste law	Annual Report	
	Availability of approved e-waste regulations	None	E-waste regulations approved by RURA	E-waste Regulations	Annual Report	
	Availability of e-waste technical guidelines	None	E-waste technical guidelines adopted by REMA	E-waste technical guidelines	Annual Report	
Output 1.1: Policy and strategy developed	Availability of approved e-waste policy and strategy	Draft policy	E-waste policy and strategy approved by the cabinet	E-waste policy and strategy	Annual Report	Continued Political Goodwill
Output	Availability of approved e-waste law and regulations	Draft law	E-waste policy and strategy approved by the cabinet	E-waste law	Annual Report	
	Availability of approved e-waste regulations	Draft e-waste regulations	E-waste regulations approved by RURA	E-waste Regulations	Annual Report	
Output 1.2: E-waste Law and regulations developed	Availability of e-waste technical guidelines		E-waste technical guidelines adopted by REMA	E-waste technical guidelines	Annual Report	
	Availability of approved e-waste standards	None	E-waste approved standards by RBS	E-waste Standards	Annual report	
Output 1.4: Procedure for disposal of state private assets reviewed	Availability of approved amendments of the procedure for disposal of state private assets law	Law on the procedure for disposal of state private assets	Approved amend ments of the procedure for disposal of state private assets law by parliament	Reviewed procedure for disposal of state private assets law	Annual report	
Output 1.5: Producers retailers, collectors, transporters, recyclers, refurbishers, dismantlers registered and licenced	No. of EEE producers/retailers registered and licenced	None	100 registered and licenced EEE producers/retailers by RURA	20 per year	Registration certificate and licences	Stakeholders commitment
	No. of e-waste transporters and collectors registered and licenced	None	30 registered and licenced e-waste transporters by RURA	6 per year	Registration certificate and licence	
	No. of e-waste Recyclers and refurbishers registered and licenced	None	20 registered and licenced recyclers by RURA	5 per year	Registration certificate and licence	
	No. of e-waste dismantlers registered and licenced	None	5 registered and licenced dismantler by RURA	1 per year		

***Strategic Area of Intervention 2** : Awareness raising and capacity building on e-waste management.*						
Outcome 2 : Awareness on e-waste and capacity increased among all stakeholders.	No. of stakeholders sensitized on e-waste management	40	1000 stakeholders sensitized	200 per year	Certificate of attendance	Continued involvement of all stakeholders
	No. of actors provided with technical assistances on e-waste management	None	50 actors provided with technical assistance on e-waste management	10 per year	Certificate of participation	
Output 2.1 : IEC tools on e-waste developed and shared among stakeholders	No. of IEC tools on e-waste developed	None	10,000 IEC tools developed on e-waste	2,000 per year	Annual Reports	Availability of funds
	No. of stakeholders shared with IEC tools on e-waste	None	1000 stakeholders provided with IEC tools	200 per year	Annual Reports	Continued involvement of all stakeholders
Output 2.2: Awareness campaigns in all districts and provinces conducted	No. of awareness campaigns conducted on e waste	None	10 awareness campaigns	2 per year	Annual Report	Availability of funds
	No. of Districts covered during awareness campaigns	None	30 Districts	30 per year	Annual Report	
	No. of provinces covered during awareness campaigns	None	4 provinces	4 per year	Annual Report	
Output 2.3: E-waste concepts mainstreamed into TVETs Curricula	Availability of approved e-waste curriculum	None	An approved curriculum by the Ministry of Education	Draft Curriculum	Annual Report	Continued political support
	No. of TVET students conducting internship programs in e-waste facilities	None	500 TVET students	100 per year	Annual report	Availability of funds
Output 2.4: Technical training and international exposure provided to key stakeholders	No. of key stakeholders trained locally	None	200 key stakeholders trained	40 per year	Certificate of participation	Commitment of stakeholders
	No. of key stakeholders trained at international level	None	25 key stakeholders	5 per year	Certificate of participation	Availability of funds
	No. of exchange conferencesconducted	None	5 conference	1 per year	Annual report	

Strategic Area of Intervention 3 : Infrastructure for E-waste handling and treatment.						
Outcome 3: Environmentally friendly e-waste facilities established	No. of green jobs created related to e-waste management	None	10,000 green jobs	2,000 per year	Annual Report	Availability of funds
	No.of collection centres	None	10 collection Centres	2 per year	Annual report	
	No.of refurbishing facilities	None	2 refurbishers	1 per 2 year	Annual Report	
	No.of dismantling/treatment facilities	None	1 facilities	1 for the 5 years	Annual Report	
Output 3.1: Detailed inventory on e-waste conducted	Availability of inventory survey report	None	Inventory Survey report validated by stakeholders	E-waste Inventory	Annual reports	Availability of Records
Output 3.2 : Appropriate Transportation and collection centres established	Tons of e-waste collected	None	2000 tons	400 per year	Annually reports	Commitment of stakeholders
						Committment of the general public and government to take back EEE for treatment
Output 3.3: Dismantling, Refurbishment and Recycling facility established	Tons of e-waste treated	None	1000 tons	200 tons per year	Annual Report	
	No. of EEE refurbished	900	5000 EEE refurbished	1000 per year	Annual report	
	Tons of e-waste recovered as secondary resources	None	100 tons	20 tons per year	Annual Report	

Strategic Area of Intervention 4 *: Resource Mobilization for proper e-waste management.*						
Outcome 4 : Resource mobilized for implementing the e-waste strategy.	Availability of a resource mobilization plan	None	Approved fund mobilization plan	Fund mobilization plan	Annual Report	Continued commitment and good will from Government
	Total amount of funds mobilized	None	1,500,000,000 Rwf	300,000,000 Rwf per year	Annual Report	
	Availability of operational e-waste fund	None	Operational e-waste fund	E-waste fund	Annual Report	
Output 4 .1 : E-waste funding mechanism and management system developed and implemented	No. of e-waste related project submitted for funding	1	5 projects	1 per year	Annual report	Continued commitment from stakeholders
	Total amount invested in e - waste management by the private sector	None	1 billion Rwf	200,000,000Rwf per year	Annual Report	
Output 4 .2: An e-waste fund established to collect EPR fee, ARF, etc and well coordinated	Availability of approved e-waste fund collection system	None	E-waste fund collection agreement by RURA	E-waste fund	Annual Report	Commitment by RURA
	Total amount of fund collected by the e-waste fund through EPR, ARF and other system	None	500,000,000Rwf	100,000,000 Rwf per year	Annual report	Availability of funds
	Total amount of funds disbursed to collectors, transporters etc	None	400,000,00 Rwf	80,000,000 per year	Annual Report	

Strategic Area of Intervention 5 *: Institutional development and coordination of E-waste management in Rwanda*						
Outcome 5: Enhanced coordination of e-waste management in Rwanda	Availability of approved steering committee	E-waste sector working group	Steering committee chaired by MYICT, Co-chaired by MINICOM and MINIRENA and having members from REMA, RURA, RDB, REB, RHA, RBS and PSF	E-waste steering committee	Steering committee meetings minutes	Political will Continued Continued commitment of key institutions
	No. of stakeholders meetings per year	1	20 meetings	4 meetings per year	Workshop reports	Stakeholders commitment
	Availability of e-waste centre ran in a PPP model	0	1 e-waste centre as a PPP	E-waste centre	Annually report	Availability of funds
Output 5.1: Ewaste steering committee formed and operationalized	Availability of approved steering committee	E-waste sector working group	Steering committee chaired by MYICT, Co-chaired by MINICOM and MINIRENA and havin g members from REMA, RURA, RDB, REB, RHA, RBS and PSF	E-waste steering committee	Steering committee meetings minutes	Political will Continued Continued commitment of key institutions
	No. of steering commttee meetings	None	10 steering committee meetings	Twice annually	Annually report	
Output 5.2: E-waste Centre established	Availability of e-waste centre ran in a PPP model	None	1 e-waste centre as a PPP	E-waste centre	Annually report	Availability of funds
Output 5.3: E-waste strategy is monitored and evaluated	Availability of strategy mid-term review report	None	Mid-term report	1 after 3 years	Report	

4.13 Proposed Implementation Framework and Budget

Table 7: Proposed Implementation Framework and Budget

Strategic Action	Key Activities	Performance Indicators		Proposed Budget					Total Budget	Implementing Agency	Time
		Description of Indicator	Target	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020			
Strengthen the legal and regulatory framework for e-waste management	Adoption of the draft e-waste policy and Law and reviewing the Law on procedure for disposal of state private assets	Number of stakeholders meetings	4 stakeholders workshops	8,700,0	- -	- -	- -	- -	**8,700,000**	MYICT	December 2015
	Develop the National E-waste regulations.	ToRsdeveloped and Consultant engage	Contract	8,808,000	-	-	-	-	**8,808,00**	RURA	March 2015
		Stakeholder workshops held, updates accepted	4 regional workshops	8,700,00	-	-	-	-	**8,700,000**	RURA	December 2015
		Updates dissented	Printed materials, IEC packages	6,700,000	6,700,000	6,700,000	6,700,000	6,700,000	**33,500,00**	RURA	Continous
	Issue and regulate e-waste handling licenses	E-waste collectors and facility operators registered	No. of ewaste collector registered	-	-	-	-	-	**-**	RURA/RDB	June 2015
		E-waste collectors and facility operators licenced.	No. of ewaste collector licensed	-	-	-	-	-	**-**	RURA/ RDB	June 2015

	Develop and Disseminate E-guidelines	Stakeholder workshops for awareness on E-waste technical guidelines held, standards accepted	4 provincial workshops	8,700,000	-	-	-	-	-	REMA//	June 2015
		Guidelines disseminated	Printed materials, IEC packages	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	50,000,000	REMA//	Annual
	Develop, disseminate and enforce E-waste standards	ToRs developed, RSB Technical working group	Contract	13,000,000	-	-	-	-	13,000,000	RBS	April 2015
		Stakeholder workshops held, standards accepted	4 provincial workshops	8,700,00	-	-	-	-	8,700,000	RBS	December 2015
		Standards disseminated	Printed materials, IEC packages	-	10,000,000	-	-	-	10,000,000	MYICT/RBS	June 2016
		Standards enforced	No. of penalties	-	-	-	-	-	-	RBS	
	Notify WTO member states on Rwanda EEE standards	Standards circulated among WTO member states	PVoC tariff set	-	-	-	-	-		RBS	

	Audit and moitor compliance of EE equipment with set standards	Quarterly inspections	Quarterly compliance Reports	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	**35,000,000**	RBS	Quarterly
	Train key stakeholders on E-waste management	Training packages approved and delivered	Quarterly training for 30 staff	10,000,000 13,300,000	- 13,300,000	- 13,300,000	- 13,300,000	- 13,300,000	**10,000,000** **66,500,000**	MYICT MYICT/ ME	May 205 Annual
		External (international training)	2 staff receive training in developed country annually	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	**50,000,000**	MYICT	Annual
Raise awareness and advocate for e-waste management across all stakeholders and general public	Prepare ewaste awareness communication strategy	Consultant engaged	Contract	16,700,000	-	-	-	-	**16,700,000**	MYICT	June 2015
		5 year communication and advocacy Plan	Communication plan	-	20,000,000	-	-	-	**20,000,000**	MYICT	June 2016
		Communication methods identified	No. of IEC materials developed	7,000,000	-	-	-	-	**7,000,000**	REMA/ MINICOM	August 2015
		Awareness campaigns	All districts covered	30,000,000	-	-	-	-	**30,000,000**	REMA	December 2015

		Number of stakeholders dialogues organized	10 stakeholders dialogue meetings held	10,000,000	-	-	-	-	**10,000,000**	REMA /MINICOM	May 2016
	Mainstreaming e-waste issues in the curriculum	Engagements with the Ministry of Education	Approved curriculum	-	16,700,000	-	-	-	**16,700,00**	MYICT/ME	June 2017
Invest in ewaste handling infrastructure	Carry out feasibility studies and designs	Carryout a feasibility study	E-waste database established	23,300,000	-	-	-	-	**23,300,000**	MINICOM/ RRECPC	March 2015
		Due diligence and transaction advise on feasibility report	Business plan for e-waste facility								March 2015
			Incentives for e-waste investments	25,125,000	69,093,750	56,531.250	-	-	**150,749,250**	MINICOM/ RRECPC	
	Set and Maintain database of EEE imported	EEE imported	Coding for EEE in place	-	16,700,000	-	-	-	**16,700,000**	RURA/RBS/RRA	June 2016
	Carry out informative studies on e-waste	ToRs developed, Consultant engaged	Contract	22,445,500	-	-	-	-	**22,445,500**	MINICOM	March 2015

		Baseline surveys every 5 years	E-waste detailed inventory Reports	-	-	-	-	-	-	MINICOM	March 2015
	Establish e-waste collection centres	Provincial collection centres MoUs with importers, retailers, system operators	4 provincial collection centres 50 from system operators, importers, retailers	157,000,000 -	- -	- -	- -	- -	157,000,000 -	MINICOM MINICOM	June 2015 December 2015
	Formation of e-waste collection schemes	Engagement with informal collectors	12 meetings with the informal sector	13,000,000	13,000,000	-	-	-	26,000,000	MINICOM / REMA	December 2016
		Registration of collectors	No. of collectors registered	-	-	-	-	-	-	RDB/RURA	Continuous
		Licencing of collectors	No. of collectors licenced	-	-	-	-	-	-	RURA	Continuous
		E-waste volumes collected	Tonnage collected per year	-	-	-	-	-	-	MINICOM	Annual
		E-waste schemes (youth, disabled and women cooperatives) functional	4 e-waste functional schemes	-	-	-	-	-	-	MINICOM/ RURA	December 2016

	Promote EEE leasing for bulk consumers	Engagement with importers and	National workshop	-	-	-	4,000,000	-	**4,000,000**	RDB/	December 2018
		Sensitization of bulk consumers like government	1 workshops on EEE leasing	-		-	4,000,000	-	**4,000,000**	RDB	December 2018
		Leasing Contracts with importers, retailers	10 contract	-	-	-	-	-	**-**	RDB	December 2018
	Training in technical colleges and schools in recovery, refurbishment and dismantling	Curriculum developed and implemented	Courses in all TVET institutions	-	16,700,000	16,700,000	-	-	**33,400,000**	ME/ REB	January 2018
	Technical skills enhancement for the informal sector and technical schools engineers	Acquisition of diagnostic machines	No of diagnostic machines	-	20,000,000	-	-	-	**20,000,000**	MINICOM and REB	December 2016
		Setting a shopping centre for second hand spare parts	1 shopping centre for second hand spare parts	-	-	20,000,000	-	-	**20,000,000**	MINICOM/ REB	December 2017
	Designing and Constructing a e-waste treatment facility	Design work of the e-waste treatment facility	Approved design work	17,000,000	-	-	-	-	**17,000,000**	MINICOM	March 2015
		Acquisition and assembling of the treatment	An ewaste treatment facility installed	300,000,000	-	-	-	-	**300,000,000**	MINICOM	July 2015

To mobilize resources for e-waste management.	Exploring e-waste fund management options	Engagement with relevant Ministries e.g MYICT and Ministry of Finance	Quarterly meetings	7,00,000	-	-	-	-	**7,000,000**	MYICT/RURA/MINICOM/ FONERWA	December 2015
		E-waste fund sources and management modalities established	Developed funding guidelines and operation procedures	-	7,000,000	-	-	-	**7,000,000**	MYICT/ MINICOM/ MICOFIN / FONERWA	June 2016
	Prepare a 5yr resource mobilizationplan	Lead agency workshops	2 workshops	-	7,000,000	-	-	-	**7,000,000**	MYICT	December 2016
		Dialogue with producers/ retailers and international partners	2 workshops	-	7,000,000	-	-	-	**7,000,000**	MYICT	December 2016
	Regulating e-waste schemes	Producer Responsible Association (PRA) under PSF functional	PRA functional	-	-	-	-	-	**-**	MYICT	
	Establish PRA	Engagement with Producers and e-waste schemes	4 workshops	-	17,000,000	-	-	-	**17,000,000**	MYICT	December 2016

	Legislation Reviewed to provide for e wastefund	Consultant/Technical working groups engaged	Contract	-	13,000,000	-	-	-	**13,000,000**	MYICT	June 2016
		Stakeholder engagement	National 2 workshop	-	8,500,000	-	-	-	**8,500,000**	MYICT	December 2016
Set up a steering committee	Set up and facilitate steering committee	Member steering committee appointed, functional (MY ICT, co-chaired by the MINIRENA and MINICOM, REMA, RURA, REB, RDB,RHA, RBS and PSF as members	2 steering committee meetings per year	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	**6,000,000**	MYICT/MINIRENA, /MINICOM	March 2015
	Bench marking e-waste activities and best practices	Meetings with key stakeholders and key players in E-waste management	2 meetings with lead agencies	1,200,000	-	1,200,000	-	1,200,00	**3,600,00**	MYICT/MINICOM	April 2015
		Regional and developed country collaboration	2 trips per year	18,000,000	18,000,000	9,000	9,000	9,000,000	**63,000,000**	MYICT	April 2015
		Monitoring framework in place	Approval by steering committee	-	-	-	-	-	-	MYICT	

Monitoringand Evaluating the implementation of the strategy	Monitoring the implementation of the implementation	Field visit of the project activities	Travelling to project activities	-	-	5,000,000	-	-	**10,000,000**	MINICOM/MYICT	January 2021
		Compiling of the Monitoring and Evaluation report	Monitoring and Evaluation Report	-	-	-	-	-	**-**	MYICT/MINICOM	January 2021
		Presentation and Submission of the Monitoring and evaluation report	National Workshop	-	-	8,700,000	-	8,700,00	**17,400,00**	MINICOM/MYICT	February 2021

5. MONITORING AND EVALUATION OF E-WASTE STRATEGY

To realize outputs of the e-waste strategy, baseline conditions and targets have been identified for proposed action areas .Monitoring will be undertaken by the MYICT and the various lead agencies involved in implementation of the e-waste strategy.

There will as well be surveillance by the steering committee on a quarterly basis to ensure all stakeholders involved are on track with planned targets.

The E-waste strategy shall receive a midterm review after three years and a full review every five years.

6. REFERENCES

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9. ANEXXES

9.1 Methodology

During the preparation of this strategy, various methods of data and information collection were used. Most of them involved consultation of stakeholders in government and the private sector.

The main method used included:

1. Data Acquisition

i) Literature review and statistical data –the current status of e-waste in the country was reviewed and analyzed on the basis of the previously, currently and trending data available on the basis of generated quantities of e-waste. This information was obtained through a desk literature review i.e use of internet and visits to relevant stakeholders e.g Ministry of Rwanda Environmental Management Authority, REMA, Ministry of Youth and Information and Communications Technology (MYICT), Ministry of Trade and Industry (MINICOM), Rwanda Utilities Regulatory Agency (RURA),etc.

Some of the documents reviewed included: E-waste Project document (ToRs) Organic Law N 04/2005 of 08/04/2005 (protection, conservation and environment), Organic Land Law N 08/2005 of 14/07/2005, Law n 63/2013 of 27/08/2013 determining the mission, organization and functioning of Rwanda environment management authority (REMA),Law Nº09/2013 of 01/03/2013 establishing Rwanda Utilities Regulatory Authority (RURA) and Determining Its Mission, Powers, Organization and Functioning, ICT Bill, RURA waste management guidelines, REMA EIA guidelines, and waste management guidelines , Standards and norms related to wastes disposal, operational and regulations standards etc

ii) Meetings and workshops – First, a one on one meeting with some of the key stakeholders who are handling and dealing with WEE were held at their premises and during workshops. Three worksops have been held to date with over fouty (40) particpants attending

iii) Surveys, questionnaire sampling – Questionnaire was prepared and circulated in soft and hard copies (attached below)

2. Collaborators for information

While reviewing the e-waste policy and developing the strategy, technical guidelines and regulations, collaborative institutions whose information could form part of these instruments was equally reviewed and formed part of the information herein.

QUESTIONNAIRE FIVE YEAR E-WASTE STRATEGY, TECHNICAL GUIDELINES AND REGULATIONS

Date:	Name :

General information about organization	
Name of organization	
Type of organization	☐ Government ☐ Education ☐ Private company ☐ NGO ☐ other: ……
Address / City	
Main activity	
Number of employees	
Name and function of contact person	
Telephone	
E-mail	

0. Introducing question
Do you know what e-waste or waste of electrical and electronic equipment is? *(describe to interviewed person what e-waste is, if necessary….)*

1. Questions about awareness and behaviour			
	Question	*Answer*	*Enhance the replies with comments, suggestions, details, etc.*
1.1	**Are you aware about the environmental hazards caused by discarded electronic equipment?**	☐ YES ☐ NO	
1.2	**Are you aware that some electronic parts may be profitably recycled?**	☐ YES ☐ NO	
1.3	**Are you aware that some hazardous fractions in e-waste need a special treatment in order to be safely disposed of?**	☐ YES ☐ NO	
1.4	**Does your organization have a policy or strategy for the management of e-waste?**	☐ YES ☐ NO	
1.5	**Does your organization keep inventories of the electric and electronic equipment it discards / stores?**	☐ YES ☐ NO	

2. General questions			
	Question	*Answer*	*Enhance the replies with comments, suggestions, details, etc.*
2.1	**Are you aware of what happens to the equipment you have discarded?**	☐ **YES** ☐ **NO**	
2.2	**From your point of view, what are the main obstacles for a proper e-waste treatment?** *(e.g costs, lack of infrastructure and/or policy within your organisation, lack of legislation, absence of recycling solutions, absence of collection system, etc.)*		
2.3	**What should be done to facilitate e-waste management (to your organization)?**		
2.4	**Would you be willing to pay for your equipment to be collected and treated?**	☐ **YES** ☐ **NO**	**If yes: at what conditions?** *(e.g. pickup service, guarantuee of proper disposal, etc.)*
2.5	**Would you be ready to give away your e-waste for free**?	☐ **YES** ☐ **NO**	**If yes: at what conditions?** *(e.g. pickup service, guarantuee of proper disposal, etc.)*
2.6	**Are you aware of any company that collects discarded e-waste for Recycling in Rwanda ?**	☐ **YES** ☐ **NO**	**If yes do they buy the waste from you? At what cost** *.)*

2.7	**Does the company (waste collectors) come and pick-up waste at your door?**	☐ **YES** ☐ **NO**	**If yes do they buy the waste from you? At what cost .)**
2.8	**Which process do you use to discard the Electronic and electrical equipment ?**		**Details :**
2.9	**Are you aware of the social and environmental consequences of discarded electrical and electronic equipment?**	☐ **YES** ☐ **NO**	**If yes give details :**
2.10	**Do you separate the general waste from E-waste?**	☐ **YES** ☐ **NO**	**If yes give details:**
2.11	**Have you and members of your organization undergone any training on E-waste collection and management**?	☐ **YES** ☐ **NO**	**If yes give details :**
2.12	**Are you aware that some hazardous fractions in e-waste need a special treatment in order to be safely disposed of?**	☐ **YES** ☐ **NO**	**If yes give example and details:**
2.13	**Are you aware there is an E-waste policy in Rwanda?**	☐ **YES** ☐ **NO**	**If yes give details**

2.14	**In your view, does Rwanda have infrastructure for E-waste handling, treatment and hazardous waste disposal?**	☐ **YES** ☐ **NO**	**If yes give details**
2.15	**What are the key issues you would like to be included in the E-waste policy?**		
2.16	**Least at least five organizations that you think should take an active role in the management of e-waste from importation to the point at which they need to be discarded**.		
2.17	**What suggestions would you give for proper e-waste management based on this particular site as the researcher?**		
	Would you be willing to pay for your equipment to be collected and treated?	☐ **YES** ☐ **NO**	**If yes: at what conditions?** *(e.g. pickup service, guarantuee of proper disposal, etc.)*

2.5	**General remarks**

Interview closure
• **Thank you for participating in this interview**

9.2 List of Stakeholders Consulted

No.	Name	Position	Institution	Contact
1.	JANVIER FORONGO	Managing Director	ABADAHIGWA KUNTEGO LTD	0783182782
2.	STEVE MUTABAZI	Chief Investment Strategist-ICT	RDB	
3.	NIYONZIMA STEVEN	National Coordinator	RRECPC	0788306742
4.	JOSEPH MUTABAZI	Standards Officer	RSB	0788749213
5.	SOPHIE NYIRABAKWIYE	Head of Environment and Poverty Unit	UNDP	0782220023
6.	NTAKIRUTIMANA J CLAUDE	Managing Director	Kigali Sanitation Ltd	
7.	UWAMAHORO Chantal	Managing Director – Cleaning	AGRUNI	0788212121
8.	CHARLES KARANGWA	Assets Management Specialist	Rwanda Housing Authority	0788546622
9.	SETH KWIZERA	Sector specialist CP	MINICOM	0788463084
10.	FORD LEONARD KARERA	Managing Director	GLEM	
11.	ERIC MURERA	Managing Director	RGEE ltd	
12.	ISRAEL DUFATANYE	Environmental Inspector	REMA	0788481541
13.	BUREGEYA PAULIN	CEO	COPED	
14.	KAYITABA EMMANUEL A.	Director of ICT	MININFRA	
15.	LEONARD MUNGARULIRE	Spiu Coordinator	MINICOM	

16.	NSANGA SLYVIE	ICT Policy standard and E-waste coordinator	RDB	
17.	NKIKABAHIZI MODEST		RDB	Modest-nkikabahizi@rdb.rw
18.	GASHUMBWA AURORE		RDB	0788583623
19.	PADOA GLORIA		RDB	
20.	GASANI GRACE	One stop Centre Investors Office	RDB	Grace.gasani@rdb.rw
21.	NKUBITO DANIEL	Entrance Public Private Discharge Officer	RDB	0788251111 Daniel.nkubito@rdb.rw
22.	IDUHOYE N. CLEMENT		RDB	Iduhoye.clement@rdb.com
23.	URANTOGO OLIVER	ICT Skills Assessment, Training Coordinator	RDB	Oliver.urantogo@rdb.rw
24.	INGABIRE ROWENNA		RDB	Roanza10@gmail.com
25.	EMMANUEL DUSENGE	Senior Engineer, ICT Infrastructure Development Ministry of Youth and ICT	MYICT	0788510943
26	ANITA HODARI	E-Waste Management Officer, ICT Department	RURA	
27	REMY DHUHUZE		REMA	0788612725
28	ENG. JEAN BAPTISTE MUTABAZI		RURA	
29	MUBILIGI PETER	Typor Approval Officer	RURA	0788834890
30	BUDASESWA THIMOTHEE	Licensing and Legal Drafting Officer	RURA	0788502912
31	BUHIGIRO SETH	ICT in Education, Director of Infrastructure and Technical Support	REB	
32.	MBERA OLIVIER	E-waste project Manager	RRECPC/MINICOM	
33.	NYAMORI STEVE	CONSULTANT	KENYA	
34.	TOSHIKAZU MITO	CONSULTANT	JAPAN	

Rwanda aims to achieve middle–income status by 2020 and a developed country by 2050, while also developing a green economy. In line with Vision 2020, the Government of Rwanda integrated ICT as a key driver for socio-economic development by adopting the Rwanda ICT for Development (ICT4D), commonly known as the National Information and Communication Infrastructure Plan (NICI). The NICI plan, which started in 2001, aims at fast tracking Rwanda's transformation to a knowledge-based society. To ensure this is achieved, more acquisition of ICT and EEE has to be done. This in the actual fact means that there is a growing trend of such equipments in the country.