Policy practices for e-waste management

Tools for a balanced and fair circular economy

Second edition - 2025

هيئة الاتصالات والفضاء والتقنية
Communications, Space & Technology Commission

This toolkit is an interactive pdf.
You can use the icons at the bottom to navigate through the document.

1. Foreword

Universal and meaningful digital connectivity is a cornerstone of economic growth and societal development. Electrical and Electronic Equipment (EEE) holds immense potential to transform lives through emerging technologies such as artificial intelligence, blockchain, and the Internet of Things (IoT).

Yet, while digital progress accelerates, a stark digital divide remains - with 2.6 billion people globally still lacking access to the Internet.[1] Bridging this gap and accelerating digitalization demands significant resources, this includes the transition to clean energy and smart mobility.

At the same time, concerns are growing over the long-term availability of critical raw materials and rare-earth elements, which are essential to digital infrastructure and devices. Today, global competition over these finite resources is already affecting supply chains.

Electronic waste (e-waste) is emerging as a vital, yet underutilized, resource. In 2022, the world generated an estimated 62 million tonnes of e-waste, including 31 million tonnes of valuable metals - 4 million tonnes of which are critical raw materials. The economic value of these materials is estimated at USD 91 billion. Yet, only 22 per cent of global e-waste was formally collected.[2]

The proper collection, reuse, or recycling, of e-waste not only prevents environmental harm but also unlocks new economic opportunities through material recovery. However, managing e-waste is complex due to the vast variety of components and materials involved.

An effective policy measure involves mandating electronics producers to take responsibility for the entire lifecycle of their products. This includes the proper management, collection and environmentally sound disposal of products at the end-of-life stage. While this model may not be universally applicable across all sectors, Electrical and Electronic Equipment Extended Producer Responsibility (EEE-EPR) is particularly well-suited to the ICT sector, where shorter product lifecycles, traceability and material value recovery make implementation both practical and impactful.

Globally, 81 countries have adopted e-waste legislation or regulation, and 67 of them include legal provisions on EEE-EPR[3]. Countries with well-enforced e-waste regulations report collection rates of up to 25 per cent - in contrast to negligible rates in countries with no such legislation.[4]

As the Kingdom of Saudi Arabia continues to embrace digital transformation and sustainability, the Communications, Space & Technology Commission (CST), in collaboration with the International Telecommunication Union (ITU), is proud to present this toolkit. It serves as a practical guide for policy-makers, regulators and industry leaders seeking to implement circular economy principles in the ICT sector.

Saudi Arabia has taken early and concrete steps towards circularity in electronics. Through the “Recycle Your Device” initiative, launched by CST, over 100,000 used devices were collected and processed in its first phase. This initiative reflects the Kingdom’s broader vision under Saudi Vision 2030 to promote environmental stewardship and build a sustainable digital economy.

This toolkit provides actionable insights and frameworks to design e-waste management systems that are fair, economically viable and tailored to local contexts. Our collective goal is to support an inclusive and sustainable digital transformation - one that preserves our environment while expanding opportunity and advancing innovation in the circular economy.

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[1] *Measuring digital development - Facts and Figures, ITU, 2024*
[2][3][4] *The Global E-Waste Monitor, UNITAR & ITU, 2024*

2. About the report

This toolkit guides national and local government policy-makers in developing an effective, inclusive and fair e-waste management system based on the Extended Producer Responsibility principle.

It covers all phases of policy and regulatory development from initial preparation to stakeholder consultation, including details on implementation, internal and external checks, as well as critical success factors.

The toolkit has been prepared as part of the "Developing and implementing e-waste policy and regulation for a circular economy" project. It is a collaboration between the Kingdom of Saudi Arabia's Communications, Space and Technology Commission (CST) and the International Telecommunication Union (ITU).

This project focused on developing and implementing national e-waste policy and regulation for the Republic of Paraguay, Republic of Rwanda, and Republic of Zambia. Significant stakeholder engagement has provided these countries with the necessary frameworks to deliver a circular e-waste management system and these country experiences and lessons learned are documented in this toolkit.

International Telecommunication Union

ITU is the United Nations specialized agency for information and communication technologies (ICTs). One mandate is to tackle the growing issue of e-waste globally. The ITU is also involved in circular economic activities, such as technical regulatory assistance, research, capacity-building and developing international standards. ITU has set a target for the "significant improvement of ICTs' contribution to climate and environment action," indicators include the global e-waste recycling rate, the number of countries with e-waste legislation and the contribution of ICTs to greenhouse gas emissions. For more information go to www.itu.int/itu-d/sites/environment.

Saudi Arabia's Communication, Space and Technology Commission

The Communications, Space and Technology Commission (CST) was established to regulate, monitor and empower the country's ICT industry, which is key to the future development and prosperity of Saudi Arabia. At the international level, CST works with other ICT regulators across the globe in order to boost cooperation, exchange information and best practice. The CST sustainability framework in this area also promotes governmental, corporate and societal responsibility with a goal to adopt sustainability best practices by fostering the circular economy and effective e-waste management. The aim is to reduce the negative impact from the unsustainable disposal of ICT devices.

How to use this toolkit

The aim of this guide is to formulate and strengthen e-waste management systems that are EPR focused. This guide pays particular attention to the preparation and development phases of e-waste management systems, which are often overlooked. The aim is to ensure that policy-makers are well-equipped to navigate the complexities of e-waste policy-making, for example system specific legal, administrative or financial elements.

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Getting started
Building the system
Implementing the system

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3. Definitions

SYSTEM DEFINITIONS

EEE
Electrical and electronic equipment includes a wide range of products with circuitry or electrical components with a power or battery supply.

WEEE/E-waste
Electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intent of reuse.

STAKEHOLDER DEFINITIONS

Collector
A natural or legal person or organization that picks up or accepts used or discarded EEE from a consumer.

Consumer
Any natural or legal person who acquires and is using EEE individually or in bulk.

Distributor
Any natural or legal person in the supply chain, who places EEE on the market.

Exporter
Any person, under the jurisdiction of the country of export, who arranges for e-waste to be exported.

Free rider
A person or organization who benefits from the actions or efforts of another, in relation to an EEE-EPR system without fully complying with the requirements of such a system.

Generator
Any person whose activities or activities under their direction produces e-waste, or if that person is not known, the person who is in possession or control of that e-waste.

Importer
Any person under the jurisdiction of the country of import who arranges for e-waste to be imported.

Informal sector
Any worker or economic unit carrying out economic activities along the e-waste value chain - in law or in practice - not covered or insufficiently covered by formal arrangements.

Manufacturer
An organization involved in producing EEE either locally or internationally.

Producer responsibility organization (PRO)
An organization that takes responsibility for collecting and channeling e-waste from producers. It is authorized or financed collectively, or individually, by EEE producers to ensure the environmentally sound management of e-waste.

EEE producer
Any natural or legal person, established in a State, who manufactures, markets or resells EEE under their own name or trademark; places on the market of that State, on a professional basis, EEE from a third country or from another State; or sells EEE by means of distance communication directly to private households or to users other than private households in a State, and is established in another State or in a third country.

Registered recycler
A licensed person or entity who processes e-waste in order to recover useful materials. Processing of e-waste may include appropriate depollution steps aiming at the removal of hazardous substances and components present in e-waste and its subsequent proper treatment and/or disposal.

Retailer
A person or organization that sells EEE to the public for use or consumption rather than for resale.

Refurbisher
A person or organization whose activity is to restore returned or used EEE for the purpose of reuse.

Regulator
An independent governmental body established by legislative act. It sets standards in a specific field of activity or operations. The regulator also establishes and enforces laws, as well as ensuring compliance with regulations.

Waste dismantler
A person or organization whose activity is to break down waste products into their component parts and constituent materials.

PROCESS DEFINITIONS

Collection
The process of picking up or accepting discarded EEE from a consumer.

Distribution
The process of making EEE available on the market.

Export
The process of arranging for waste to be exported.

Import
The process of arranging for waste to be imported.

Manufacturing
The process of making or producing of EEE either locally or internationally.

Production
The process of manufacturing or placing on the market or reselling EEE under a brand name or trademark; placing on the market of that country, on a professional basis, EEE from a third country; selling EEE by means of distance communication directly to private households or to users other than private households in a country.

Recycling
The process of recovering useful materials from e-waste. This may include appropriate depollution steps aimed at the removal of hazardous substances and components present in e-waste, and its subsequent treatment and/or disposal.

Refurbishment
The process of restoring returned or used EEE to a reusable condition.

Waste dismantling
The process of separating a waste product into its constituent parts, components or other groupings.

PRINCIPLES

All-actors approach
This refers to all entities that have access to e-waste and therefore are involved in the collection, logistics, preparation for reuse, refurbishment, treatment, or recycling of e-waste, or in the associated monitoring, legislative and enforcement activities. They are subject to minimum legal obligations regarding compliance with legislation, reporting to the competent authorities or meeting official standards and communication.[5]

Circular economy
The principle of a continuous, positive development cycle preserving and enhancing natural capital. This also involves optimizing resource yields and minimizing system risks by managing finite stocks and renewable flows, while reducing waste streams.[6]

Circularity
A principle that ensures products, materials and resources are maintained at their highest value, and for as long as possible, within the economy in order to minimize the generation of waste and maximise use.

Extended producer responsibility (EEE-EPR)
The principle of promoting total life cycle environmental improvements of product systems by extending the responsibility of the manufacturers of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product.[7]

This toolkit refers to EEE-EPR throughout, this is in reference to EPR specifically for EEE.

[5] *An enhanced definition of EPR and the role of all actors, WEEE Forum, 2020*
[6] *Guideline for the development of an e-waste management system, ITU, 2024*
[7] *EPR - Guidelines for sustainable e-waste management, ITU, 2018*

Abbreviations

Acronyms/ initialisms	Meaning
CAG-WEEE	Consultation and Advisory Group on WEEE (Paraguay)
CONATEL	Comisión Nacional de Telecomunicaciones (Paraguay)
CPR	Collective Producer Responsibility
CST	Communications, Space and Technology Commission (Kingdom of Saudi Arabia)
CTSP	Collection and Transportation Service Providers
DINATRAN	Dirección Nacional de Transporte (Paraguay)
DNA	Dirección Nacional de Aduanas (Paraguay)
EEE	Electrical and Electronic Equipment
EPR	Extended Producer Responsibility
ICT	Information and Communication Technology
IMS	Individual Management System
INE	Instituto Nacional de Estadística (Paraguay)
IoT	Internet of Things
IPR	Individual Producer Responsibility
ITU	International Telecommunication Union
MADES	Ministerio del Ambiente y Desarrollo Sostenible (Paraguay)
MEC	Ministerio de Educación y Ciencias (Paraguay)
MEF	Ministerio de Economía y Finanzas (Paraguay)

Acronyms/ initialisms	Meaning
MEPs	Minimum Energy Performance Standards
MIC	Ministerio de Industria y Comercio (Paraguay)
MININFRA	Ministry of Infrastructure (Rwanda)
ODS	Ozone Depleting Substances
PoM	Put-on-Market
PRO	Producer Responsibility Organization
PSF	Private Sector Federation (Rwanda)
RICA	Rwanda Inspectorate, Competition and Consumer Protection Authority
REMA	Rwanda Environment Management Authority
RRA	Rwanda Revenue Authority
RURA	Rwanda Utilities Regulatory Authority
SGP-AEE	Sistema de Gestión Posconsumo de los Aparatos Eléctricos y Electrónicos
SNPP	Servicio Nacional de Promoción Profesional (Paraguay)
SSP	Storage Service Providers
StEP	Solving the E-waste Problem Initiative
WEEE	Waste Electrical and Electronic Equipment (or e-waste)
ZEMA	Zambia Environmental Management Authority
ZICTA	Zambia Information and Communications Technology Authority

4. Policy issue timeline

Figure 1. How to create a plan for e-waste policy instruments (will continue on next page)

Policy issue timeline continued

6.

Formulate a first brief of the policy issue and initiate a consultation process. This typically begins with government and prominent civil society bodies.

7.

Undertake a market landscape assessment across the EEE sector to determine current roles and positions, as well as potential responsibilities of industry stakeholders.

8.

Establish a clear and concise, unified, position that the whole government will adopt. This is a whole system approach to be taken on the policy issue.

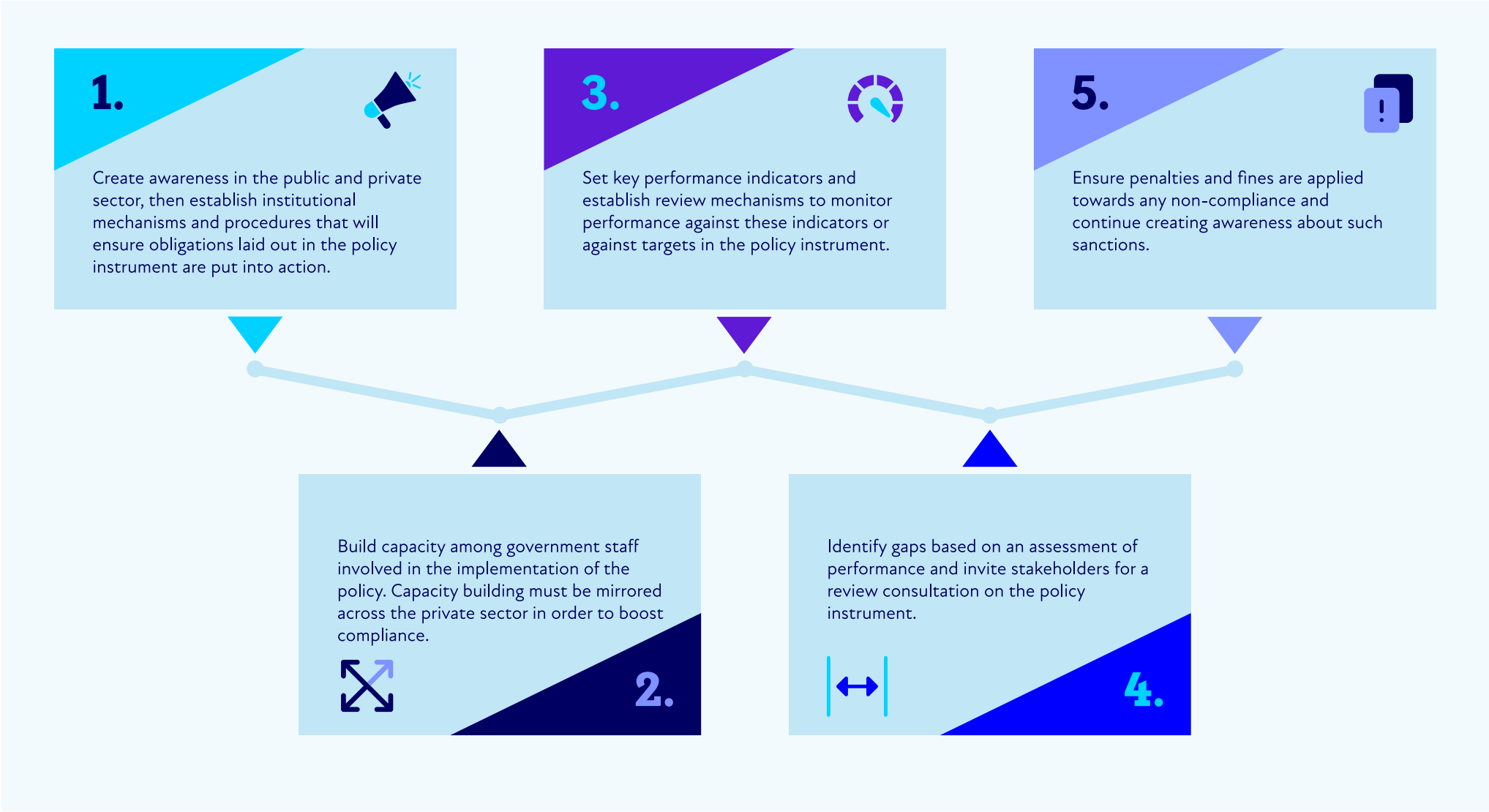
9.

Communicate and consult with the wider public and private sector, as well as civil society, about the system approach. This includes policy and regulation.

10.

Achieve a consensus on the system approach and validate the policy/regulation before submission of the final instrument to the law commission, cabinet, president's office or parliament.

Figure 2. How to effectively implement e-waste policy instruments



5. Global e-waste challenge

62 million tonnes

of e-waste was generated globally

67 countries

have EPR legal provisions on e-waste

The global e-waste challenge is a pressing issue that continues to grow as the consumption of EEE becomes ever greater. In 2010, 34 million tonnes of e-waste was generated globally; in over a decade this amount has almost doubled. In 2022, humanity generated 7.8 kg of e-waste per head of the global population. Even today, less than a quarter is properly collected and recycled.[8] This gap needs addressing with better e-waste management policies.

One of the main challenges is the stagnation in collection and recycling rates. Only 48 countries have targets for e-waste collection rates, 37 of which have targets for e-waste recycling rates.[9] In low-income economies, the informal sector can play a significant role in e-waste management. However, this sector often has very low efficiency rates when it comes to resource recovery. It also fails to meet environmental or health and safety standards. Additionally, the prices for rare earth elements are still too low to support large-scale commercial recycling operations.

The improper management of e-waste also has a severe impact on human health and the environment. E-waste contains toxic and persistent substances, such as flame retardants, which can cause significant harm when not managed properly. Non-compliant e-waste management releases 58,000 kilograms of mercury and 45 million kilograms of plastics, containing brominated flame retardants, into the environment every year.[10] This leads to the harmful emission of acids, dioxins, furans and other toxic substances. This poses health risks to workers and local communities.

Better e-waste management can have a positive impact on societies. Urban mining, which involves the recovery of valuable resources from e-waste, offers a more sustainable approach to resource use. It creates local economic opportunities, conserves natural resources, reduces environmental degradation, and enhances supply chain security.

The economic value of the metals contained in e-waste globally was estimated to be USD 91 billion in 2022. Yet e-waste management practices only generate USD 28 billion from recovered metals. Most losses occur due to incineration, landfill or substandard treatment.[11] The growth rate of countries implementing e-waste policies, legislation or regulation is also decelerating. While 81 countries have adopted e-waste policies, only 67 have legal provisions on EPR for e-waste.[12]

Countries with e-waste legislation tend to have better documentation and management infrastructure, but enforcement remains a global challenge. Governments often lack the institutional capacity to implement and enforce legislation, leading to inefficiencies and non-compliance.

This toolkit aims to help policy-makers drive change. This is why it is a step-by-step guide for the environmentally sound management of e-waste with a focus on actionable solutions. The goal is to ensure the maximum recovery of valuable resources and tackle the growing burden of e-waste globally.

USD 91 billion

The economic value of the metals contained in e-waste globally in 2022

[8][9][10][11][12] *The Global E-Waste Monitor, UNITAR & ITU, 2024*

6. Expanded toolkit

6.1 Getting started

How to approach e-waste management

Making sense of policy, strategy and regulation

How other policy issues support the implementation of EEE-EPR

Guiding questions on other policy issues

Consider money, information and material flows

How do you engage stakeholders?

Stakeholder roles

How to approach the post-consumer management of EEE

6.2 Building the system

Create a well-defined scope of EEE products

The key legal definitions in EPR policy

Core components of the EEE-EPR system

Obligations for stakeholders in the EEE-EPR system

How policies in other areas can support EEE-EPR

Create a level-playing field for engaging producers

Financial considerations for the EEE-EPR system

Technical and framework costs for the EEE-EPR system

Organizational models for the EEE-EPR system

6.3 Implementing the system

Create a national working group

Set appropriate targets

First steps after introducing the regulation

1. Register as many EEE producers as possible
2. Actively support the set-up of PROs
3. Provide training and increase capacity
4. Raise awareness about the regulation
5. Attract international investment
6. Consider harmonization at a regional level

6. Expanded toolkit

6.1 Getting started

How to approach e-waste management

Tackling e-waste management and related policy issues is an important yet often complex task, since there are a number of ways to address this issue. The development of a comprehensive e-waste management framework and policy requires many decisions and the involvement of numerous stakeholders, including different government agencies.

Firstly, the most politically contentious questions must be addressed. This involves asking who should pay for e-waste management. Should the consumer pay? Should the EEE producer pay? Also, who should be responsible for delivering change?

Secondly, it is important to establish which government department should take the lead. Once decided, communicate this custodianship with other departments and stakeholders. This way, effort is coordinated and with one point of contact, there is accountability throughout the policy-making process.

Thirdly, break the e-waste management system into components.

Table 1. EEE-EPR system components

Legal	Administrative	Financial
A successful system is governed by clear and concise regulation.	**Documented procedures, clearly defined roles and responsibilities are essential.**	**Economically viable fees are key to having an appropriately financed system.**
A thorough consultation and review process needs to be undertaken into the existing regulatory framework, gauging the appetite for adjustments and updates. This should include a concerted level of public and private sector stakeholder consultation, followed by drafting or re-drafting of new or existing regulations. This process requires high-level direction. Should existing regulations be updated? Should a new standalone regulation be drafted or are both of these steps needed?	A complete system design for the post-consumer management of EEE needs to be developed. The design should be agreed among all technical-level stakeholders. This also requires a coordinated system of briefings and updates to high-level leadership. These are presented alongside the regulatory changes being drafted by the legal team. The administrative architecture for all new procedures should also be developed, detailing roles and responsibilities. Ideally this should be in a digital format.	A detailed understanding of both the technical and the framework costs needs to be calculated. These costs must be applicable to the system designed by the administrative architecture and justified by the regulatory framework. Costs must be reclaimed. Therefore, it is important to draft details of how fees will be collected and how they will be spent. This will require significant capacity building and engagement with producers.

Making sense of policy, strategy and regulation

Different instruments serve different purposes where each has their own levers on different actors in the e-waste space. When starting, it is essential to understand the focus of each. The issuance of regulations on EPR in the EEE sector can be accompanied by guidelines. To avoid extremely long documents, it is possible to split them. Regulation typically covers the what, who, and when, and guidelines include the how and why with respect to roles and responsibilities.

Table 2. Typical e-waste policy documents and levers of government action

TYPICAL E-WASTE POLICY DOCUMENTS	
Type	Description
E-waste management strategy	**This is high-level and typically not legally binding.** It is designed to inform stakeholders with details on how to reach targets. It sets out a new vision on achieving this. This spells out overall priorities but also explores sector-specific issues. Its high-level nature makes it suitable for regional e-waste management strategies. It can be national, provincial or even municipal level in focus.
E-waste management policy	**A statement of intent by a government to tackle a particular issue.** It is a non-legally binding document and typically contains a specific mission, vision and policy objectives with associated strategies. It often contains an action plan set out by government. It can be national, provincial or even municipal level in focus.
Legislation	**It is overarching in nature and covers environmental issues.** Hazardous or special waste might be singled out with details. Typically it gives a particular government ministry the power to develop regulations.
E-waste management regulation	**The document can be called "Decree", "Act" or "Ordinance" among other terms.** It contains legally binding obligations and is typically developed to imply the way a legislation is legally enforced by regulators.

LEVERS OF GOVERNMENT ACTION	
Specific focus	Description
E-waste technical management	Many countries lack e-waste technical management capacity. E-waste collection infrastructure, e-waste processing facilities, as well as recycling and recovery expertise, are also absent. Policy on technical management is focused on developing standard strategies, technologies, and practices to responsibly manage e-waste, from collection and sorting, to recycling and recovery.
EEE procurement and disposal	Procurement involves the purchasing or servicing of EEE. Covering material composition, product design and obsolescence management is also important. Asset disposal, including end-of-life practices, such as take-back programmes, are key.
EEE sector EPR	The starting point is the EPR framework, where EEE producers are required to set up systems for the collection, recycling, and recovery of end-of-life products. This ensures that valuable materials are captured and reused. It also reduces the volume of waste going to landfills and supports the circulation of resources through the active engagement of relevant private sector stakeholders.
Hazardous waste management	E-waste can be classified as a hazardous waste stream due to its toxic components. A focus on hazardous waste management addresses the safe and environmentally sound handling, treatment, and disposal of these components, since they pose a threat to human health and the environment.
Trade of EEE	Importation of new and used EEE also needs to be regulated. In some cases, this includes permitting and licensing trade provisions. Some countries have an outright ban on used EEE imports. A focus on trade and transboundary movements of EEE products (new or used) and e-waste aims to control illegal and/or undesired transboundary movements via rules and procedures.

Figure 3. Hierarchy of system instruments

How other policy issues support the implementation of EEE-EPR

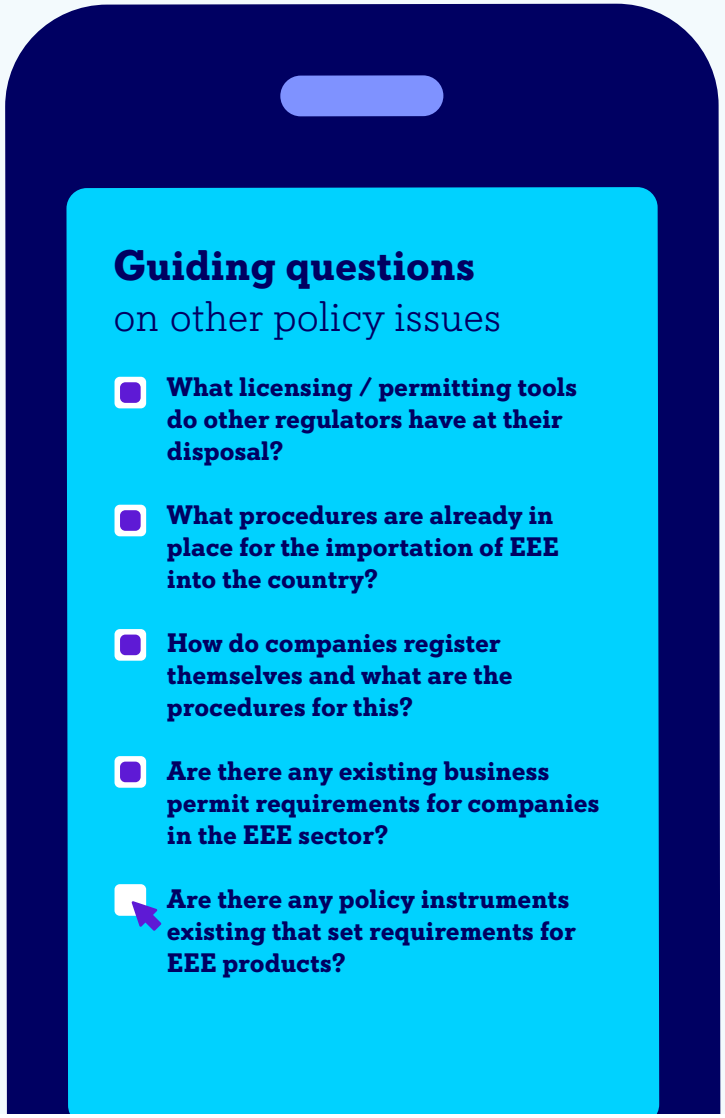
The regulation of e-waste management is a cross-sectoral issue. This has typically been addressed through policy and compliance mechanisms that have primarily been focused on the environment.

When the EEE-EPR principle is being defined, it is crucial to include input from other sectors. Existing policy instruments and governing processes in other parts of the economy could support improved compliance towards EEE-EPR.

Regulations overseeing the licensing of business permits in the EEE sector could also be extended to embrace EEE-EPR. This may include business registration processes, processes for the importation of products through customs, dealer and supplier licenses and company taxation rules.

Establishing e-waste responsibilities across regulators beyond the environmental sector, such as ICT and telecommunication regulators, consumer protection and inspection, agencies and business licensing authorities, is equally important, as these entities may play a key role in licensing and permitting processes.

Guiding questions on other policy issues



> ***We have taken significant steps towards establishing regulatory mechanisms to curb the increase in generation of e-waste in our country, Rwanda. Through the Communications, Space and Technology Commission CST – ITU, a dedicated group of stakeholders from across key sectors including ICT, environment, customs and inspection and consumer protection have analysed our country's existing frameworks for the journey of introducing EPR in Rwanda, thanks to this project, it has been a holistic one. The importance of a cross-sectoral approach to regulating e-waste through EPR could not be emphasized more.***

Charles Gahungu, General Manager of ICT Regulation, Rwanda Utilities Regulatory Authority.

Consider money, information and material flows

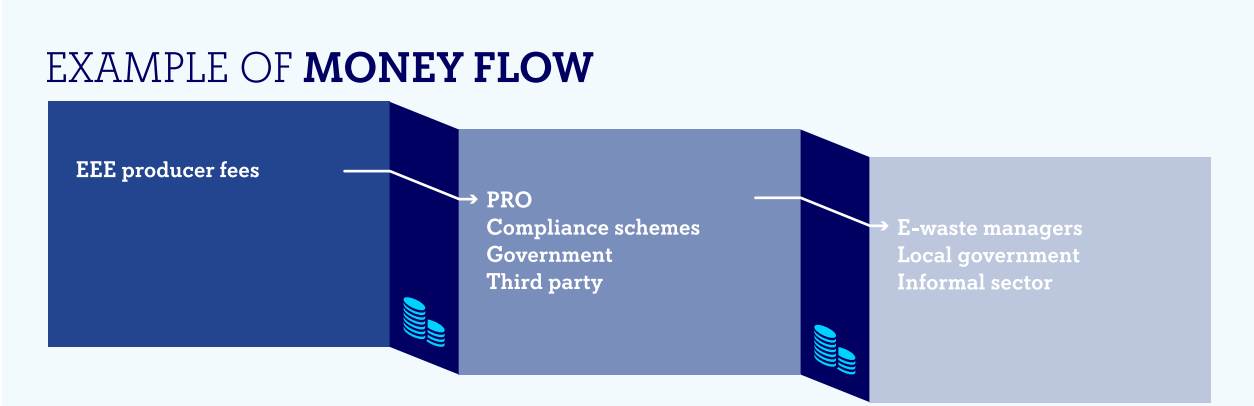
Across the post-consumer management system of EEE there are three main flows. These include money, information and material. It is essential to explore how these look in practice.

Consider who pays whom

This toolkit focuses on the fair, inclusive and timely application of the EEE-EPR principle. However, it is vital to assess whether EEE-EPR is the right environmental policy mechanism to improve e-waste management compared to other approaches. The direction taken will depend heavily on the existing policies, laws and regulations.

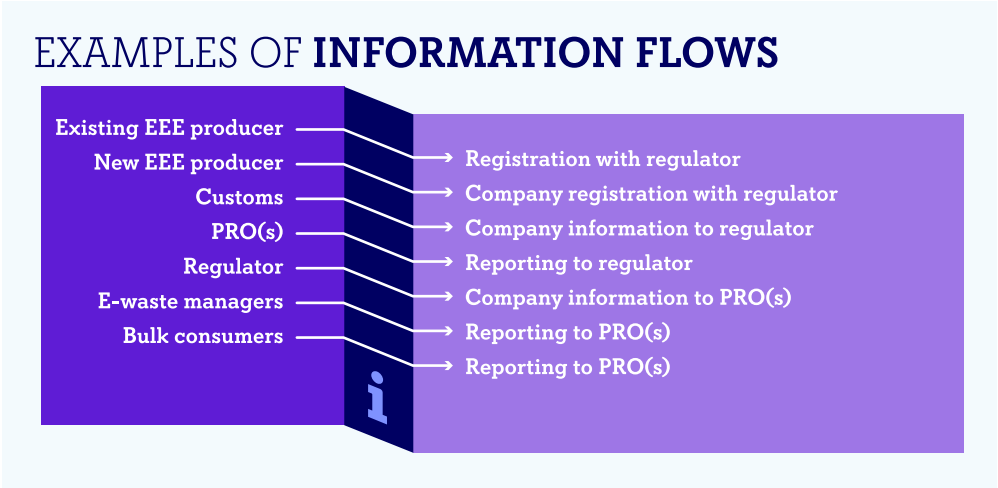
WHO PAYS?	TO WHOM?
Taxpayers	To the state as part of the tax regime.
Consumers	To a public or private sector body, typically as an advanced recycling fee.
Waste holders	To a service provider / producer responsibility organization.
Producers (EEE-EPR)	To a service provider / producer responsibility organization.

Figure 4. Example of money flow



Documented procedures and clearly mapped roles and responsibilities are essential.

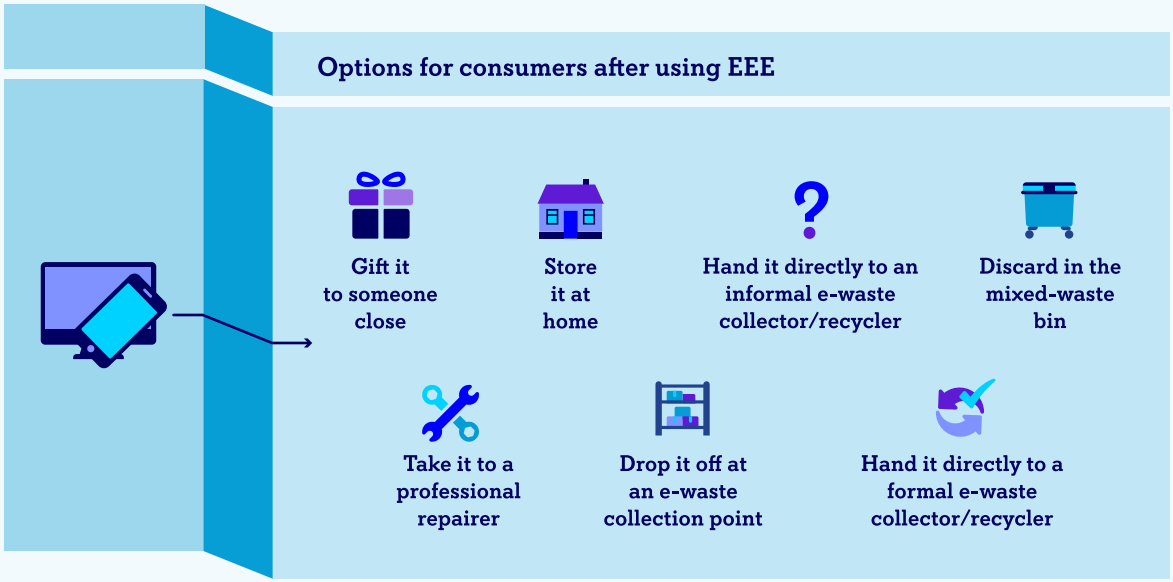
Figure 5. Examples of information flows



It is important to map out who provides information to whom so that there is clear understanding of information flows.

Products enter the market as new or used EEE, or in some cases as e-waste. Once used, consumers then face a discarding decision.

Figure 6. Examples of material flows



How do you engage stakeholders?

This process consists of three steps: identification of stakeholders, analysis of stakeholders and mapping of stakeholders.

Figure 7. Stakeholder identification

Figure inspired by dss+

Figure 8. Stakeholder analysis

Figure inspired by dss+

Stakeholder mapping

A visual representation of stakeholders can help policy-makers. It is useful to understand levels of engagement. Mapping also provides a consistent stakeholder evaluation using specific criteria. The relative interest and influence a stakeholder has can be visualized using a matrix.[13]

Figure 9. Interest - influence matrix

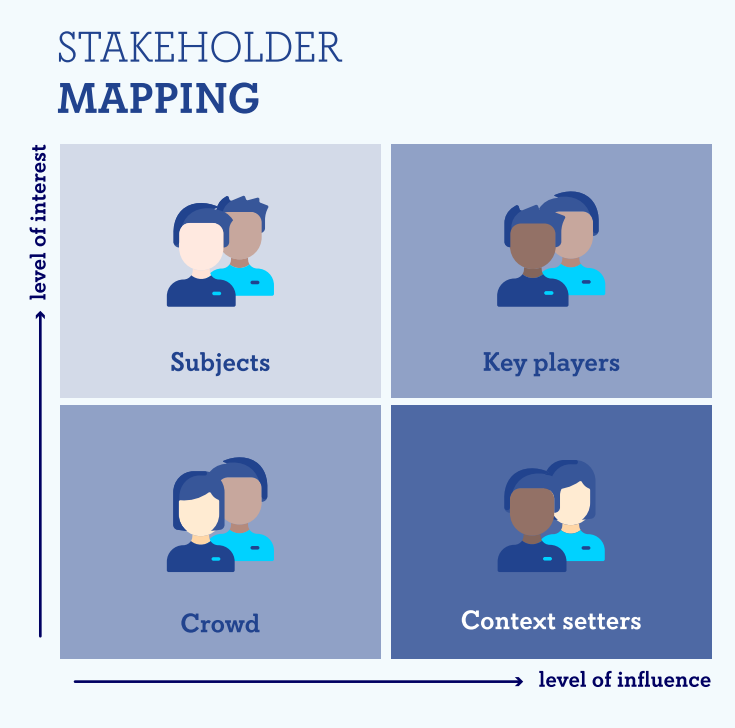


Figure inspired by dss+

Key players

Stakeholders with high levels of interest and influence. Priority should be given to engaging actively with this group to bring about change.

Context setters

Highly influential, but they have little interest in the project. However, they may have significant influence over the success of the project, yet they are difficult to engage with.

Subjects

These have high levels of interest in the project but low levels of influence. They are unlikely to play a significant role in supporting the implementation of the project.

Crowd

Stakeholders who have little interest or influence on the outcomes of the project. As with the case of subjects, the influence or the interest of the crowd may change with time.

[13] *Adapted from: Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of Environmental Management, 2009*

Stakeholder roles

Identify individuals, groups and organizations who either influence e-waste policy instruments or are affected by them. This is the first step towards stakeholder consultation and defining roles and responsibilities.

Table 3. The roles of national, local government, civil society and the private sector (will continue on next page)

Group	Involvement
National government including ministries, departments and agencies	
Environmental protection	Enforcement of regulation often through a national agency or authority. This oversees implementation of policy or regulation.
Finance, revenue, customs	Financing mechanisms to govern e-waste management. It outlines import duties for products and may manage pricing of EEE.
Health, awareness, education	Health and safety awareness-raising activities, capacity-building and training programmes.
ICT growth and governance	Licensing and oversight of ICT/telecommunication activity. It implements regulation that closely relates to placing on the market and disposal of new, as well as used, ICT/telecommunication devices.
Labour rights and conditions	Guiding occupational health and safety for actors in e-waste management. Supports informal sector transition to formal work.
Trade and commerce	Overseeing policies related to the placing of EEE on the market by importers, including their tracking, monitoring and registration. This is in line with international trade rules.
Data and statistics	Collecting and managing data about EEE put on the market in a given year. This includes data about lifespans and consumer behaviour. It identifies where to collect this information.
Standards, guidelines and conformity	Developing national standards supporting the implementation and enforcement of products and processes related to EEE/e-waste. Includes standards that could be made mandatory by incorporation in law.
Public works, facilities and transportation	Overseeing the logistical requirements of transporting e-waste between different locations and the infrastructure in place to serve this. Involved in overseeing procurement and disposal policies for EEE/e-waste.
Local government	
Municipality	Implementation of laws related to e-waste locally, ensuring local communities are equipped with appropriate e-waste collection infrastructure including drop-off points.

Civil society	
Academia	E-waste research, capacity building and identifying good practices internationally. Conducts local and national research to ensure a science-based approach is taken on formulating policy decisions. Implements pilot projects where necessary.
Non-governmental organizations	Creating synergies across borders to accelerate the sharing of international best practices. Encourages innovation and provides support to those establishing e-waste management businesses, especially entrepreneurs and small and medium-sized enterprises.
Consumers (bulk and individual)	Consumption and use of EEE. Takes onboard awareness and marketing around the responsible disposal of e-waste. Complies with local laws on the bring-back of e-waste and prohibits the disposal of e-waste outside of formal facilities. Reuses or repairs EEE before bringing it back for collection and treatment.
Private sector	
Brands and original equipment manufacturers	Supply chain coordination to ensure registration with relevant authorities is done for EEE / e-waste obligations. Complies with all mandatory requirements on EPR / EEE / e-waste. Takes the initiative through voluntary initiatives in the absence of mandatory requirements.
Dealers and importers	Supply chain coordination with brands and customers to ensure legal obligations are met on EPR / EEE / e-waste. Takes the initiative through voluntary initiatives in the absence of mandatory requirements.
Domestic distributors	Brick and mortar / domestic retail of EEE. Creates awareness and marketing for staff and customers. Offers free-of-charge, convenient and accessible e-waste drop-off. Provides collected e-waste free-of-charge to EEE producers / PROs and / or other collectors.
Online distance-sellers	Supply of EEE to domestic customers via online platforms based overseas. Complies with legal requirements in the destination country and with e-waste related requirements placed on the online marketplaces(s) being used.
Collectors, dismantlers, repairers and recyclers	Managing e-waste and working closely with other private sector stakeholders, consumers and municipalities. Supports efforts to meet national e-waste collection and recycling targets. Adheres to environmental permits and impact assessment regulations.

How to approach the post-consumer management of EEE

E-waste collection and recycling rates have improved substantially as a result of policy, regulation or legislation. In the majority of cases, these instruments include EEE-EPR provisions. It is this principle that drives how the EEE post-consumer management system evolves over time. Mandatory systems are also more fruitful than voluntary ones. This is because there is more of a level playing field, more enforcement and less free-riding.

The EEE-EPR system specifically assigns responsibility to EEE producers for making products, putting them on the market, and managing their disposal. EEE producers are therefore motivated to minimize their environmental impact across the product lifecycle. This is central to the circular economy philosophy. EEE-EPR schemes require EEE producers to set up systems for the collection, recycling, and recovery of end-of-life products. It ensures that valuable materials are captured and reused. This reduces the volume of waste going to landfill and supports the circulation of critical resources.

EEE-EPR is not the only policy approach, and its full, partial or mixed application, can be very beneficial. Its implementation is dependent on differing local contexts, such as technical and framework costs, cultural norms and geographical factors.

Table 4. Considerations for the post-consumer management of EEE (will continue on next page)

Things to consider	Possible approaches
Who should bear financial responsibility for e-waste?	• Consumers pay a fee when they purchase an EEE product, typically called an advanced recycling fee or environmental handling fee. This can either be visible or not visible on the receipt. • EEE producers pay a fee as part of EPR. This can be done upon import of each consignment, or it can involve a fee for registration with the EPR system, or payment is based on the weight of products placed on the market. • Waste generators such as individuals, household consumers or bulk consumers pay a fee for the collection and recycling of their e-waste. • Tax-payers pay for a regular and formal municipal waste collection service that includes e-waste. • Both EEE producers and consumers pay. EEE producers pay upon EPR registration, and consumers pay upon purchase as an environmental handling fee for eventual e-waste management.

Things to consider	Possible approaches
Who should collect fees / levies / taxes / payments for e-waste?	• A collective approach to producer responsibilities involves the presence of one or more PROs or compliance schemes, which EEE producers pay an EEE-EPR fee to. • The government registers EEE producers with the EEE-EPR system and charges a fee for this registration process, including renewals, which is paid by EEE producers. • EEE producers pay government / service provider upon importation of EEE. Payment is per consignment as part of the import permit. • In the instance of individual producer responsibility, an EEE producer could pay a service provider to manage its EEE-EPR responsibilities on an individual basis. • On purchase of EEE consumers could pay a fee to domestic distributors involved in brick-and-mortar retail or to online distance-sellers retailing EEE via online marketplaces. • Waste holders could pay a fee to an entity mandated to take-back old and end-of-life products as e-waste. • Tax-payers could pay for regular and formal e-waste collection through their public utility tax or similar.
What role should EEE producers play?	• Individual producer responsibility, where each EEE producer is responsible for financing and implementing the collection and subsequent recycling of their own products. • EEE producers collectively finance the collection and recycling of products, regardless of brand. PROs / compliance schemes can also be formed by EEE producers, or producers collectively pay an intermediary. In both cases, producers are supported with compliance and take-back. This way recycling obligations of the EEE producer are overseen by the PRO. • The option to choose either an individual or collective approach within the same mandated EEE-EPR system. • EEE producers only have a financial responsibility to pay a fee upon EEE-EPR registration and each renewal of the registration, with no organizational responsibilities. • EEE producers must individually make efforts to implement EEE-EPR in line with legislation, whilst also paying an EEE-EPR fee upon registration, as well as a fee on each registration renewal.

6.2 Building the system

Create a well-defined scope of EEE products

A well-defined list of EEE products should be included in the EEE-EPR system. The list must be defined in law. This is typically detailed in an annex or schedule.
The list should be clearly conveyed to stakeholders and regularly monitored so it can be updated over time.

Policy-makers should consider the following:

1. The range of EEE products, whether items are new or used, should directly correspond to the range of e-waste, so no item is lost.
2. Within the EEE / e-waste list, there can also be categories of equipment. These are based on equipment lifespans, material composition and end-of-life characteristics. Products can also be classified as ICT, lighting or appliances.
3. There is a relationship between collection / recycling targets, costs of e-waste management and EEE-EPR fees. Consequently it is important to define, at what category level, these three aspects are to be considered, with targets for each category.
4. The level of consumer understanding is an important factor when defining the range of EEE products. It must be clear which products are included in the EEE-EPR system and which are not. Consumers are more able to understand specific products such as a television, rather than categories, such as screens or monitors.

The Global E-waste Statistics Partnership (GESP) breaks EEE down into six categories.

Figure 10. EEE categories

1. Temperature exchange equipment

More commonly referred to as cooling and freezing equipment, this category comprises items such as refrigerators, freezers, air conditioners and heat pumps.

2. Screens and monitors

The category of screen and monitors refers to televisions, monitors, laptops, notebooks and tablets.

3. Lamps

Included in this category are fluorescent, high-intensity discharge and LED lamps.

Adapted from: Forti V., Baldé C.P., Kuehr R. (2018). E-waste Statistics: Guidelines on Classifications, Reporting and Indicators, second edition. United Nations University, ViE - SCYCLE, Bonn, German

4. Large equipment

Large equipment refers to washing machines, clothes dryers, dishwashers, electric stoves, large printers, copying equipment and photovoltaic panels.

5. Small equipment

Small equipment includes vacuum cleaners, microwave ovens, toasters, electric kettles, electric shavers, electronic scales, calculators, radios, video cameras, electrical and electronic toys, small electrical and electronic tools, small medical devices, small monitoring and control instruments, and e-cigarettes.

6. Small IT and telecommunication equipment

This category refers to mobile and other phones, personal computers, GPS devices, routers and printers.

It is important to be clear which products are not to be included in the EEE-EPR system. There can be several reasons for not including certain products in the scope:

1. The product or product group is governed by another law. This is typically the case for batteries, including batteries for electric vehicles and e-mobility devices.
2. The product or product group is of strategic national importance. This might include products relevant to national security, military or medicine.
3. The product or product group may be phased in later. Initially the EEE-EPR system might focus on a handful of products, such as those that are widely consumed, including ICTs.

See Annex 1 for global examples of product scope.

Key legal definitions in EEE-EPR policy

E-waste
The most important definition is that of e-waste. There are a number of definitions available such as those in the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, which defines e-waste as:

"EEE that is waste, including all components, sub-assemblies and consumables that are part of the equipment at the time the equipment becomes waste."

The Solving the E-waste Problem (StEP) initiative, defines e-waste as:

"Items of all types of EEE and its parts that have been discarded by the owner as waste without the intention of re-use."

EEE
The *StEP initiative* also provides an easily understood definition of EEE:

"Any household or business item with circuitry or electrical components with power or battery supply."

Producer
The definition of an EEE producer in the context of the EEE-EPR system:

"The entity first placing EEE on the market is the producer."

It is essential to make a clear distinction between who is, and who is not, a producer. Since regulations often place a financial and/or organizational responsibility on the EEE producer within the EEE-EPR system.

Retailers
Retailers can be difficult to accurately define since they can carry out either, or both, of the following activities:

- Place products on the market directly as a distributor, as the first entity doing so, and retail those same products in their brick-and-mortar stores in the country, or online on their website, or a third party's website within the country.
- Purchase the products that they sell in their retail outlets in the country, or online on their website, or a third party's website within the country, from a distributor who is the entity that has first placed those products on the market.

The term **'Put-on-Market'** is commonly abbreviated as 'PoM'. This refers to a quantity of EEE products, as defined by the EEE-EPR legislation, which is brought into the market and effectively sold to an end-consumer in a specified period of time. PoM can refer to the total quantity of products brought to market by all obliged EEE producers, or to the quantity brought to market by one individual EEE producer. It is typically quantified for one financial or fiscal year.

> ***Identifying the right stakeholders goes beyond a procedural step. Regulations that define which entities are responsible, accountable and impacted become actionable frameworks and are more likely to bear effective impact. Defining stakeholders as clearly as possible in legislation is a foundational act for the extended producer responsibility system.***

Mwenya Masabo Mulenga, Principal Legal Counsel, Zambia Environment Management Agency.

Table 5. Examples of stakeholder definitions

Country	Stakeholder	Definition
FEDERAL REPUBLIC OF NIGERIA	**Assembler**	A person or group of persons who bring, fix together separate parts of EEE.
	Importer	A person or body corporate, that imports EEE in the ordinary course of conduct of a trade, occupation or profession.
	Informal collector	A person who searches and picks waste that can be reused or recycled and does not belong to a formal organisation.
	Producer	The brand owner, manufacturer, franchisee, assembler, distributor, retailer or first importer of the product who sells, offers for sale, or distributes the product, it also includes the local manufacturer or importer of new and used electrical and electronic equipment to be placed on the national market at first invoice by sale or donation.
DOMINICAN REPUBLIC	**Consumer**	Any natural or legal person that acquires and uses EEE, individually or in bulk.
	Distributor	Any natural or legal person, other than the producer, that markets EEE before its sale to the consumer.
	Assembler	Any natural or legal person, which, as a producer, assembles EEE for multiple other producers.
	Manufacturer	Any natural or legal person, which, as a producer, is involved in the manufacturing of EEE, either locally or internationally, and has a physical presence in the country.
	Generator	Any natural or legal person, public or private, that produces waste as a result of their activities of production services provision, marketing, importing, and consumption, among others.
	Importer	Any natural or legal person which, as a producer, imports or transports EEE from one country to another.
REPUBLIC OF SINGAPORE	**Producer**	A company that 1) carries on the business of supplying the regulated product in Singapore; and 2) in the furtherance of that business: 1) Imports the regulated product into Singapore; or 2) Manufactures the regulated product in Singapore; or 3) Engaged another person to manufacture the regulated product in Singapore or otherwise causes such manufacture.

See Annex 2 for more global examples of stakeholder definitions.

Consumers

The process of defining the consumer is essential in the post-consumer management of EEE, since the consumer can take different forms and face different obligations under the law. The reference to consumer combines two categories:

- **Individual/household consumer**
  citizens and households consuming EEE for purposes of leisure and household maintenance.
- **Bulk consumer**
  large public and private sector organizations. These might include local and national government facilities and commercial premises of the private sector. Typically, these would be the office buildings where office workers use screens and IT equipment.

Core components of the EEE-EPR system

There are three core components to a well-functioning post-consumer management system for EEE. These are legal, financial and administrative. It is helpful to break the design of the EEE-EPR system into these components.

The three core components

1. **Legal regime**
   - A successful system is governed by regulation(s) that are clear and concise.
   - Thorough consultation and review into the existing regulatory framework is needed.
   - Concerted public and private sector stakeholder consultation and drafting required.
   - High-level direction from government to steer the regulatory development forward.

2. **Financial mechanism**
   - The most sustainable system is one that is self-financing, EEE-EPR can help to achieve this.
   - A detailed understanding of both the technical and framework costs is needed.
   - The system must reflect the different costs and the law must justify fees in response.
   - A realistic operational mechanism that can both collect and spend such fees is essential.

3. **Administrative arrangements**
   - A complete system design for post-consumer EEE management to be developed.
   - Roles and responsibilities among stakeholders must be clarified in the system.
   - The movement of money, information and materials across the system must be clarified.
   - Procedures resulting from new legal obligations must be efficient and ideally digitalized.

Regulation can only be effective if the system is adequately mapped out prior to the law being implemented. All stakeholders must be consulted when doing this mapping. It includes all stakeholder interactions and details the flows of information, materials and money.

Figure 11. Simple interactions and flows for the EEE-EPR system

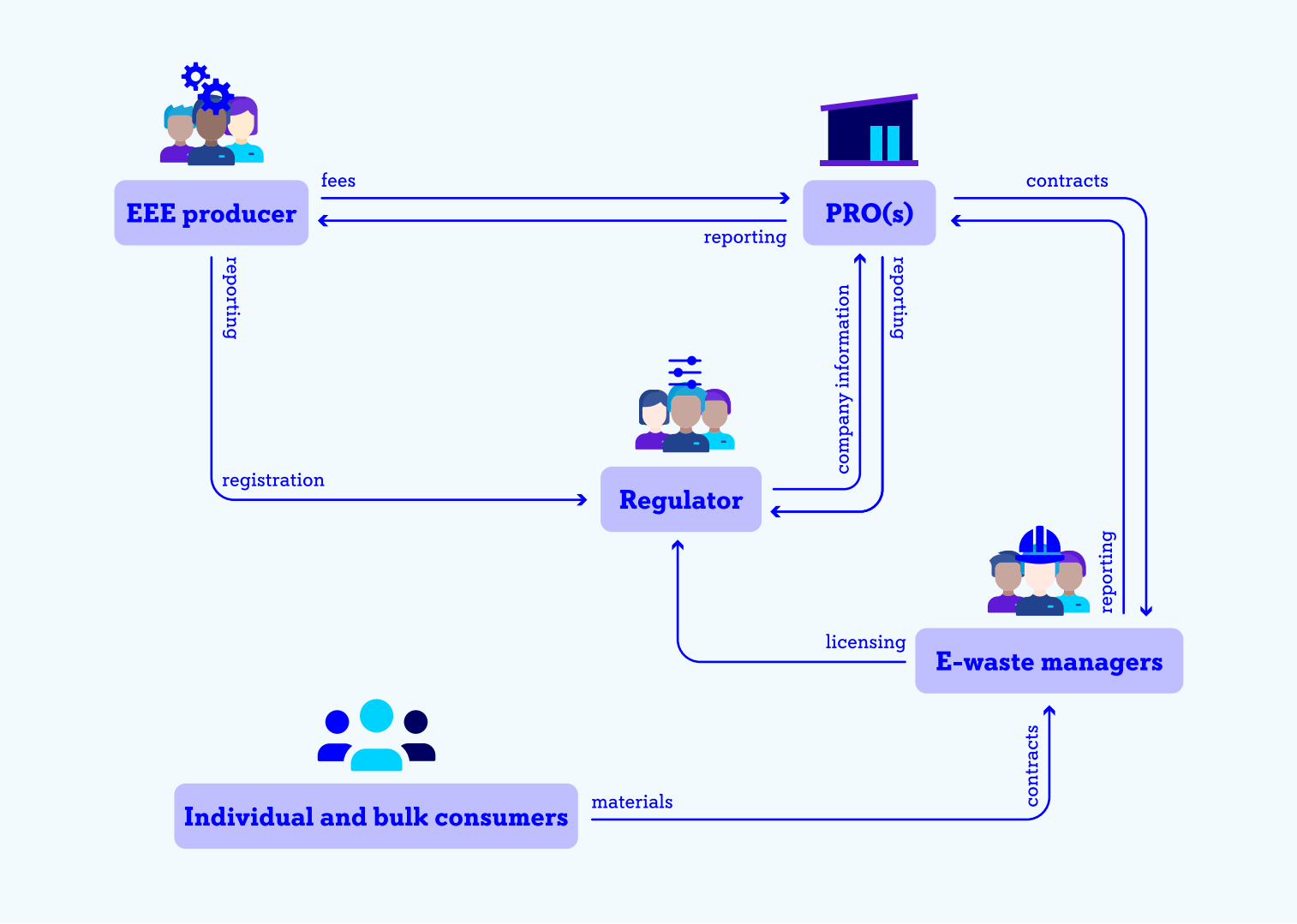
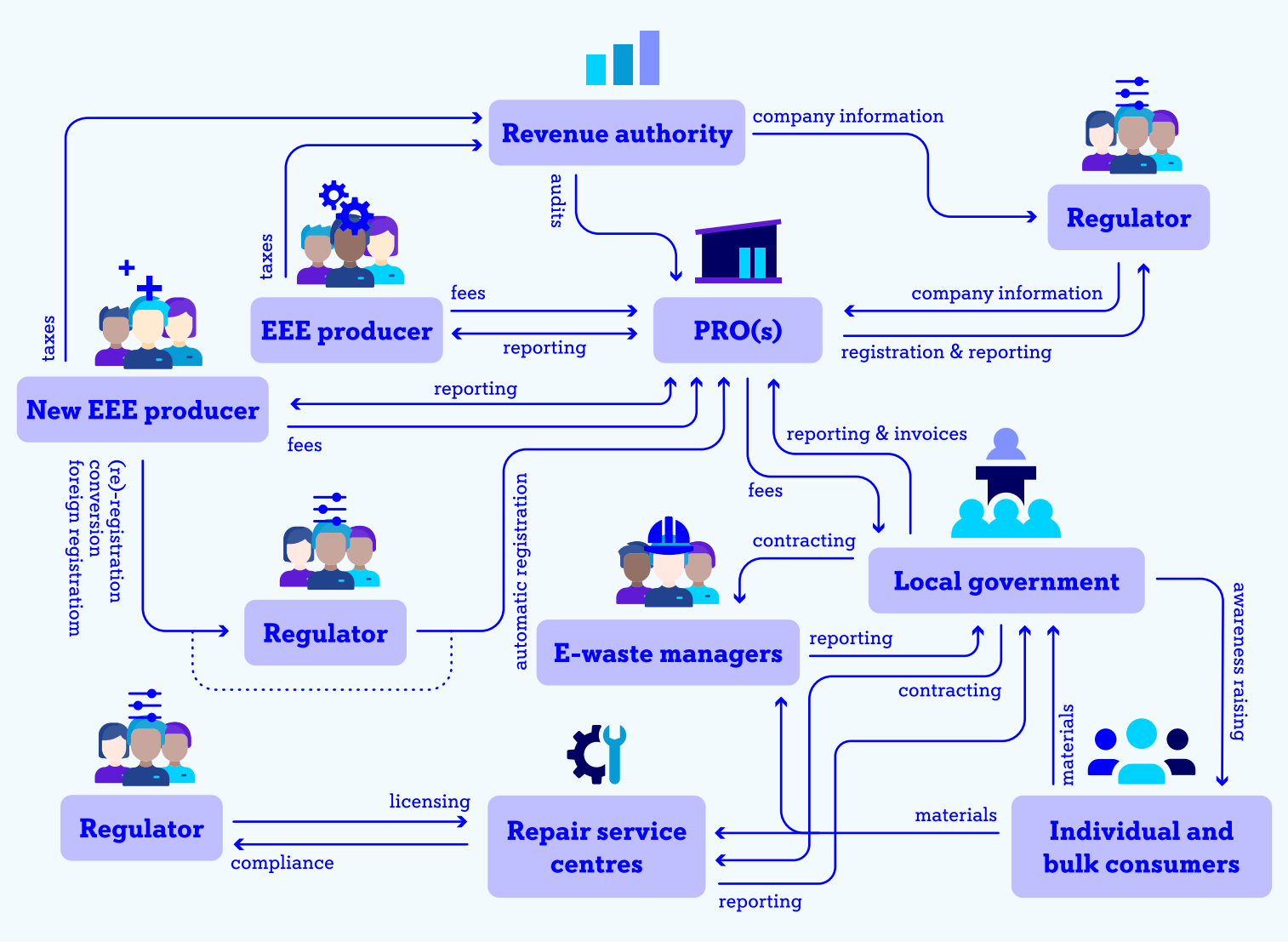


Figure 12. Complex interactions and flows for the EEE-EPR system



> ***It takes time to get the design of the EPR system right. It is worth dedicating time to equip it with a robust governance structure with distinct roles and responsibilities for stakeholders, interlinked by clearly mapped flows of financing and information. As the PRO-to-be for EEE in Rwanda, getting the EPR system design right was a key step to building strong public-private partnerships and empowering all actors towards circularity.***

Callixte Kanamugire, Chief Advocacy Officer, Private Sector Federation, Rwanda.

Obligations for stakeholders in the EEE-EPR system

See Annex 3 for sample obligations for EEE producers.

Designing the right EEE-EPR scheme

The mapping exercise allows policy-makers to have a clear idea about what EEE-EPR system to put in place. It also allows a better understanding of how interested parties could be obliged to act. The following actions will allow policy-makers to design the right scheme:

1. **Define the nature of the EEE-EPR system**
   EEE-EPR can be mandatory or voluntary. However, the eventual intention should be to compel all EEE producers to comply, not just a proactive few. If it is to be mandatory, then the parts of the system that are to be mandatory must be clear and concise in policy terms.

2. **Determine the role of the EEE producer**
   There are different types of EEE producers and their interactions with the system vary. There are also different ways that EEE enters the market as a product purchased by a consumer within the country. And EEE can be placed on the market by the EEE producer as new or used products. Definitions should be robust and clear. There should be some level of regional harmonization so cooperation across borders is facilitated.

3. **Set out EEE-EPR responsibilities**
   Individual producer responsibility (IPR) schemes are mainly applied in business-to-business contexts. In most EEE-EPR schemes, however, collective producer responsibility (CPR) is preferred. CPR schemes are usually operated through a PRO that carries out collection and/or recycling of e-waste on behalf of its members. However, policy instruments should make provisions for producers to be able to implement IPR, as it encourages eco-friendly product design.

4. **Decide on the types of responsibility**
   Producer responsibility for e-waste management can be either financial or organizational, or both. These options can also be defined in different ways. EEE producers may pay EEE-EPR fees to the PRO. This can be based on how much EEE they place on the market. Fees may be paid to the government through the form of an EEE-EPR registration fee, or both types of payments may be made in the same system. EEE producers may instead pay EEE-EPR fees direct to the government, not a PRO. It is important to define the high-level financial and/or organizational responsibility in the early stages. Retailers may also bear these responsibilities too.

5. **Decide on the level and type of cost coverage**
   This defines how the costs of e-waste management under the EEE-EPR system will be calculated. The question is - which fee model to follow? For instance, the EEE-type-dependent cost per unit multiplied by the volume put on the market could be the amount paid or whether EEE producers bear the full costs. They could also share costs with other stakeholders.

6. **Describe how non-compliance will be tackled**
   This defines the timelines, grace periods, and steps for the rollout of the EEE-EPR system, together with responsible stakeholders. It is advisable to have a gradual rollout of enforcement steps focused on changing stakeholder. This includes penalties for producers, and other stakeholders, who fail to comply with their responsibilities. Penalties could include fines, cancellation of licenses, or law enforcement. Penalties should be nuanced and increase over time in order to incentivize compliance, while not threatening the viability of SMEs.

Table 6. What is included in EEE-EPR regulation and guidelines?

Regulation	Guidelines
What? **This includes details on what different stakeholders are obliged to do, as well as what roles and responsibilities they have.**	**Why?** **This includes details on obligations that are in place in the regulation and why a specific policy approach is being taken.**
When? **This includes details on when certain obligations need to be carried out, including their frequency.**	**How?** **This refers to how the obligations will be implemented.**
Who? **This includes details on who will carry out certain obligations.**	
examples 1. Clear definitions of the stakeholders, processes and principles. 2. Clear scope of the products covered and not covered by the regulation. 3. Clear roles and responsibilities of each stakeholder. 4. Clarity on the movement of money, information and materials. 5. Clear stipulations on who covers the cost of e-waste management. 6. Clarity on the policy approach and the financing mechanism. 7. Clear information regarding reporting requirements among stakeholders. 8. Clear targets such as those for e-waste collection and recycling. 9. Clear stipulations on enforcement and non-compliance measures. 10. Clarity concerning any grace periods or transition periods.	***examples*** 1. Details about administration procedures such as registration and reporting. 2. Details about the relationships among stakeholders in the value chain. 3. Details about the components of the policy approach, such as EEE-EPR. 4. Details about the financing mechanism such as calculation methodology. 5. Details about the target setting and the calculation methodology. 6. Details about data collection and data management in the system. 7. FAQs and contact information, as well as further details about the regulation.

Constructing the right EEE-EPR policy

Typically, the preparation of an e-waste strategy can be a good precursor to regulation. The strategy is not legally binding but will establish a national vision. It will also define interactions for stakeholders across the value chain. Any strategy or policy developed must be actionable. It must therefore come with an implementation plan with targeted and timely guidance for the sector.

Regulation is legally binding. This is why some countries keep implementation guidelines separate to the regulation. However, some countries combine all this information into one document. This makes for a lengthy piece of regulation. Ultimately, the objective is to be clear and concise.

See Annex 4 for sample content of an EPR regulation on e-waste.

How policies in other areas can support EEE-EPR

Policies that regulate e-waste can come from a number of sectors. The effective governance of this waste stream can be achieved through multiple policies. Its governance can also include policies that are unrelated to the environment.

Policies on taxation, customs, company registration, business permits, ICT sector dealers and operator licensing can all tackle issues to do with e-waste or the EPR system. Using existing policies avoids duplication and can ensure a low burden of administration, while a high administrative burden hinders compliance and can increase costs.

> ***ICT authorities are not just regulators — they are stewards of a sustainable digital future. By embedding environmental responsibility into the licensing of ICT operators and registration of dealers, they can transform markets and oversee that every device placed on the market is a step towards circularity and responsible e-waste management.***
>
> Elliot Kabalo, Manager of Standards and Electronic Networks, Zambia ICT Authority.

Table 7. Policies that relate to e-waste and the EEE-EPR system

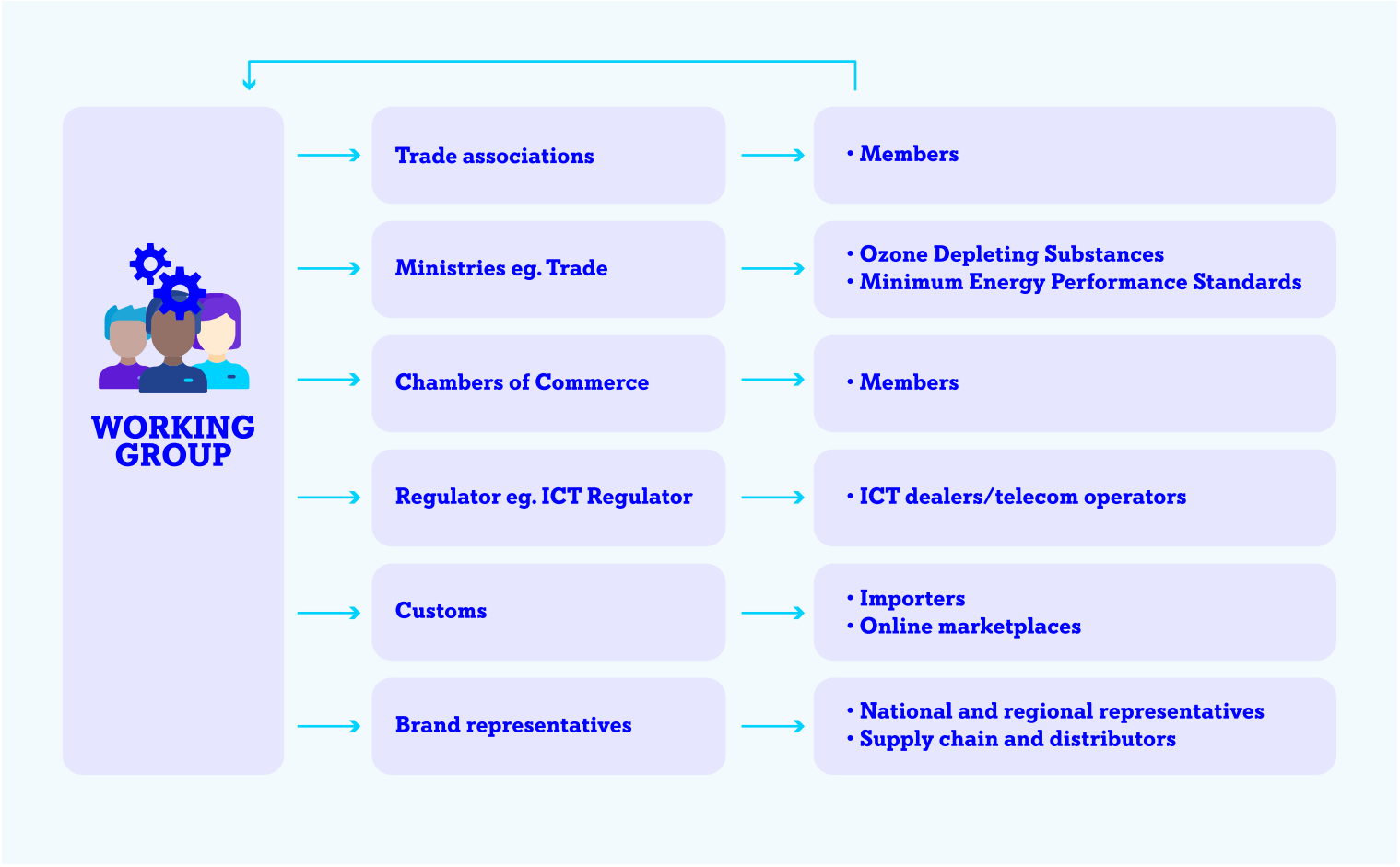
Policy issues	E-waste / EEE-EPR relationship
Taxation	Provides incentives for EEE-EPR compliance by the EEE producers
Customs	Controls imports based on compliance of the EEE producers
Companies	Offers procedures for automatic registration of EEE producers with the EEE-EPR system.
Business permits	Delivers automatic notifications to the regulator or the PRO, if a single, national level PRO, about the existence of a new producer.
ICT licensing	Where e-waste and EEE-EPR-related requirements are included in the licensing of ICT dealerships, in line with the national EEE-EPR regulation.

Create a level-playing field for engaging EEE producers

Firstly, the government must create a consensus about the particular model of EEE-EPR it wishes to support with regulation. Secondly, as policy-makers begin to develop their e-waste policy, they must engage with producers as early as possible. EEE producers should be heavily involved in the consultation process. Regulation should specifically focus on how to achieve producer compliance. Confusion can arise if producers are not involved in the development of regulation, and this will only delay compliance.

EEE producers that represent all categories of EEE, such as heating, ventilation and air conditioning, home appliances, ICT equipment, lamps and solar must be involved in these consultations. The fair representation of different product categories will ensure that regulations do not unduly favour one form of e-waste over another. However, if policy-makers decide to begin with one product category, then all EEE producers in that category should be involved.

Figure 13. Where to find EEE producers



The working group can be effective by working closely with the different entities who have direct contact with EEE producers. This involves identifying all EEE producers in the country and creating an initial inventory of them.

Table 8. Example of simple inventory form for identifying EEE producers

No	HS Code	Tax ID	Equipment category	Company name	Company contact	Address
1	8418.10	838473824	Combined refrigerator-freezers, fitted with separate external doors	Icebox Ltd.	contact@icebox.com	41 North Road, Anytown
2	8516.72	232534595	Electro-thermic appliances for domestic use, toasters	BakeBright General Stores Co.	contact@bakebright.com	80 Main Street, Anytown
3	8517.12	984488754	Telephones for cellular networks or for other wireless networks	NewPhone Retail Group Ltd.	contact@newphone.com	76 Bell Street, Anytown
4	8539.50	656766555	Light-emitting diode (LED) lamps	Lumina General Stores	contact@lumina.com	98 Sunrise Avenue, Anytown
5	8467.21	746543756	Drills of all kinds, with self-contained electric motor	BobBuilder Ltd.	contact@bobbuilder.com	55 Woodpecker Alley, Anytown

Financial considerations for the EEE-EPR system

Table 9. Compliance activities for the EEE-EPR system

Four broad categories of compliance activities exist for the EEE-EPR system. These can be deployed separately or in combination.[14]

Category	Description	Examples of EEE-EPR instruments
1. Deploy product take-back requirements	Assign responsibility for the end-of-life management of products.	• Collection and/or recycling targets for a product or material. • Incentives for consumers to return used products.
2. Use economic and market-based instruments	Provide financial incentives to implement the EEE-EPR policy.	• **Deposit-refund:** Initial payment at purchase, then refunded when product is returned. • **Advanced disposal fees:** Fees at purchase, then used to finance end-of-life management. • **Material taxes:** Tax on virgin materials to incentivize use of recycled materials. • **Upstream combination tax/subsidy (UCTS):** Tax paid by EEE producers, then used to subsidize waste management.
3. Implement regulations and performance standards	Encourage the take-back of end-of-life products through standards.	• Mandatory minimum recycled content standards on products. • Voluntary minimum recycled content standards from industry.
4. Employ information-based instruments	Raise public awareness to indirectly support EPR programmes.	• Reporting requirements. • Product labelling. • Consumer communication about producer responsibility and waste separation. • Recyclers information about materials used in products.

[14] *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management. OECD, 2016.*

E-waste management has a cost. It is an important factor in its effective delivery. The cost is dependent on a number of variables. If consumers pay, this can result in higher product costs. This then has an impact on spending power and household incomes. Some argue that if producers pay these costs they are likely to be passed on to consumers.

The EEE-EPR scheme is based on two foundational principles. These should guide finances including the setting of fees:

- **Full cost coverage:** Fees must be sufficient to cover the entire cost of environmentally sound e-waste management, including collection, transportation, treatment and safe disposal.
- **Cost-effectiveness:** The system must be economically efficient to ensure its long-term viability, regardless of whether costs falls on producers, consumers or the government.

Financing the EEE-EPR system is a complex problem. It is important to understand the true cost and the local context when considering financing. The most important aspect is to determine technical and framework costs from the beginning.

Questions to ask
when considering financing

- Who will pay for e-waste management?
- How much does it cost to manage e-waste?
- What is the fee that EEE producers will have to pay to finance the EEE-EPR system?
- How will the fee be calculated?
- What will the frequency of payments be?
- Will there be cross-financing, where the costs of managing some EEE product types may be subsidized by the financing of other product types?
- Which organization will run the EEE-EPR scheme and who will collect the EPR fee?
- How will the fees be collected?
- What will the fees that are collected be used for?

Understanding the cost of e-waste management in your country is a really important step in building the system. EPR is a policy approach that is based on fees being paid, so getting to know how much things cost can really help the policy-making process. Transparency is also good when it comes to working with producers, and it is important to get their buy-in.

Gustavo Rodriguez, Director, Directorate of Environmental Quality Control, Ministry of Environment and Sustainable Development, Paraguay.

Technical and framework costs for the EEE-EPR system

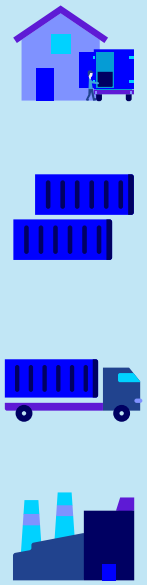
Table 10. How product categories and characteristics influence technical costs

	Category	Weight/size	Environmental/health	Material/value
	1. Temperature exchange equipment			
	2. Screens and monitors			
	3. Lamps			
	4. Large equipment			
	5. Small equipment			
	6. Small IT and telecommunication equipment			

> ***We are aiming for the EPR regulation, which is being developed in a participatory manner with all sectors, to be implemented. This will have a significant impact on the Republic of Paraguay, since e-waste management will have a sustainable path. We hope the impact will be felt at all stages of the consumption and management chain. The CST - ITU project has helped facilitate the interaction of a range of institutions across government, all of which have an important contribution to make to our e-waste regulation.***
>
> Victor Martinez, Member of the Board of Directors, National Telecommunications Commission, Paraguay.

Understanding the cost of e-waste management in the country is essential. Typically the costs come from two sources: the costs that arise during the management of e-waste (technical) and the costs arising from compliance with the EEE-EPR system (framework).

Figure 14. Technical costs



Access to waste
Costs to get e-waste from original holder (consumer).

Collection
Costs for hiring and purchasing of collection infrastructure.

Transport
Costs for transportation from collection point/consumer to facility.

Treatment
Costs for proper treatment, including disposal of hazardous parts.

Source: Adapted from dss+

Figure 15. Framework costs

Enforcement
Costs for enforcing all legal provisions and controlling EEE producer registration.

Audit and standards
Costs for auditing facilities, operations and procedures.

Awareness raising
Costs of raining public awareness, proper disposal, public campaigns

Financial guarantees
Costs covering financing situations producer ceases to exist.

Research and development
Costs covering continual improvement of the EEE-EPR system.

Source: Adapted from dss+

Further information can be found in Annex 5.

Organizational models for the EEE-EPR system

The EEE-EPR system can adopt one of the following organizational models. The choice of model depends on factors such as regulatory capacity, market structure, as well as environmental and economic goals.

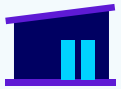
- **Government-led model:** the government oversees fee collection and system administration.
- **Producer-led model:** EEE producers design and implement the system under regulatory supervision.
- **Hybrid model:** combines government oversight with producer-led implementation, balancing flexibility with accountability.

Table 11. Details of Producer Responsibility Organization (PRO) models

Type of PRO	Strengths	Weaknesses
State-funded model EEE producers pay an eco-fee or eco-levy to a designated waste management fund operated by the government.	• High legal certainty for EEE producers. • Limited liability for EEE producers. • Level playing field for all EEE producers.	• Dependent on political priorities with a risk of funds being allocated to unrelated issues where programmes may be underfunded. • Fees that are set by the fund manager may be unrealistic. • Limited oversight and transparency. • Limited third-party regulatory oversight.
Industry-led monopoly model EEE producers form a not-for-profit entity that operates as a PRO.	• Minimum overhead costs through economies of scale. • High technical standards can be set for recyclers. • Often competitive bidding for recyclers to access e-waste streams from the PRO. • Transparency around costs and revenues of the PRO for EEE producers who are members. • Easier to regulate as a single entity.	• Requires collaboration and agreement with all procedures. • Can create cost complacency and the accumulation of funds in the PRO. • Compliance risk is likely for EEE producers when concentrated on a single source.
Compliance service provider model Private businesses that provide the services of a PRO for a fee to the EEE producer.	• Competitive market for compliance and treatment that can drive efficiency and innovation. • Flexibility for EEE producers to choose one or more service providers.	• Greater complexity to regulate EEE producer compliance. • Higher overall system administration cost. • Potential for race to the bottom regarding treatment costs and standards. • Requires large volume of e-waste to be generated in order to be viable.

EEE producers should be given the freedom to freely organize themselves when establishing a PRO. However, defining the high-level parameters for the organization of EEE producers should be a key component of any mandatory EEE-EPR system. There are also several considerations for policy-makers when looking at PROs since there a number of options to choose from:

Table 12. Defining different types of PROs (will continue on next page)

Types	Definition
For-profit PRO 	A for-profit PRO is a private entity operating within the EEE-EPR system and designed to generate profit while fulfilling environmental and regulatory obligations. It operates as a commercial enterprise and charges fees to manage end-of-life of products. This option offers competitive services for producers while staying efficient and innovative. It can be scaled quickly. However, a profit motive may conflict with environmental goals and offer less transparency than not-for-profit PROs. This option is well-suited to high-value waste streams and competitive markets.
Not-for-profit PRO 	Established to support producers to meet their legal obligations under the EEE-EPR system. A not-for-profit PRO operates with the primary mission of environmental stewardship and regulatory compliance. It reinvests any surplus revenue into improving e-waste management systems, education or capacity-building. It is funded by fees collected from EEE producers. It often operates with oversight from other stakeholders. Its governance is usually run through a board representing producers, industry associations and public authorities, where decisions are made with a collective benefit in mind. A not-for-profit PRO aims to be mission-focused and transparent. It often enjoys more trust from regulators and the public due to its non-commercial nature. However, it may be less agile and innovative. It may also lack competitive pressure. A not-for-profit PRO is well-suited to economies with no other option to invest in waste management and in which close oversight is deemed crucial.
Single PRO 	In a single PRO framework, only one organization is responsible for managing the collection, recycling and reporting obligations for producers. The PRO acts as the sole interface between EEE producers and regulatory authorities. It coordinates the system, collects and reports data for reporting. A single PRO also sets the EEE-EPR fees and collects them from EEE producers to fund e-waste management operations. Its centralized operations reduce administrative costs, while facilitating monitoring and enforcement. It tends to reduce market fragmentation and ensures consistent service delivery. However, this also means that EEE producers cannot choose a service provider that best fits their need. With a single PRO strong oversight is needed to ensure transparency, fairness and performance.

Types	Definition
Multiple PROs 	In an EEE-EPR system with multiple PROs, EEE producers can choose from several competing PROs to fulfil their legal obligations. This model introduces market dynamics into the EEE-EPR framework. Each PRO operates under the same regulatory framework but may offer different pricing, service quality, innovation and environmental performance. Under this model, PROs are incentivized to innovate, while the market pressures PROs to offer lower fees and better value for producers. Some PROs may decide to focus on specific sectors or services offering tailored solutions. However, coordination across multiple PROs can be complex and regulatory authorities must monitor and enforce rules across several organizations. Having multiple schemes for similar products may lead to duplication of effort and inefficiencies in logistics and infrastructure.
Sectoral PRO 	A sectoral PRO is dedicated to serving a specific industry sector or product category, such as IT and telecommunications equipment, lighting or solar for instance. The PRO operates within a defined sector and tailors its operations and compliance strategies to the characteristics of that sector's products. It tends to be composed of EEE producers from the same industry or product category and may originate from a chamber of commerce or industry federation, or take the form of an industry association or a coalition of companies within the sector. With deep sectoral knowledge and strong alignment with sector needs, the PRO facilitates collaboration within the sector. However, it may lack economies of scale and be less competitive than other forms of PROs.
Multi-sector PRO 	A multi-sector PRO manages EEE-EPR obligations across multiple product categories, such as EEE, packaging or batteries, for instance. This type of PRO must comply with different regulations for the sectors it serves. Instead of focusing on a single type of product, it provides services for a broad range of materials and waste streams. It acts as a one-stop solution for companies with multiple product lines. It achieves economies of scale by sharing systems and insights across multiple sectors. However, its operations require expertise in multiple regulatory frameworks and waste streams. Also, its resources may not be evenly distributed across sectors, favouring high-volume or high-margin streams.

PROs must require a license from the relevant authority to operate. They must also have a clear reporting process to this authority. The regulation must set out clear rules for compliance by EEE producers to the PRO and with the authority. This will ensure smooth implementation.

A transition period can be included in regulation for things such as registration with the EEE-EPR system by EEE producers and signing up to a PRO. Such a period is typically six to 12 months. Enforcement and penalization of non-compliant EEE producers is essential to stop free riding. PROs should work with regulators and other enforcement agencies to support monitoring and compliance. In particular, this should include the sharing of information about the number of registries on the EEE-EPR system versus the number of PRO producer members and whether there are any discrepancies.

6. Expanded toolkit

6.3 Implementing the system

The EEE-EPR system and its associated policy must be well-designed and mapped out from the beginning if it is to be effective. Continuous improvement is essential, so is the continual assessment of national targets, including those for collection, as well as recycling, and the appropriateness of targets over time. It is also important to continually evaluate the amount of fees paid by producers, the effectiveness of compliance and the scope of the products included in the EEE-EPR system.

Continuous appraisals are essential because the landscape of electronics and new technologies entering the market is always changing.

Create a national working group

Establishing a national working group does not have to be regulated by law. However, its inclusion can ensure its mandate is more robust. A working group also contributes to the viability of the EEE-EPR system in the long-term. It can provide a platform for debate where the effectiveness of the system is discussed by both the public and private sector. Debates are focused on continuous improvement.

The circular economy and EEE-EPR systems are high on policy-makers' agendas. There is also strong interest from international partners, donors and development agencies, who may provide resources. It is imperative to manage these resources effectively and avoid duplication. A national working group that includes the embassies and development agencies of overseas partners can help achieve this.

Set appropriate targets

It has been proven that when mandatory targets are included in regulation, collection and recycling rates go up and the EEE-EPR system is more effective.

Countries that regulate e-waste management with legally binding instruments setting collection and recycling targets, or with e-waste legislation or policies, have an average documented formal collection and recycling rate of 25 per cent. This rate is close to zero per cent for countries that have no such policy instruments in place.[15]

It is important to set collection and recycling targets based on data gathered by a national baseline assessment. Targets should rise gradually over time, allowing companies to adapt. They should also be realistic and reflect market costs. This is because operational costs for businesses fluctuate. Higher costs can mean lower collection and recycling rates.

Therefore, collection and recycling targets should be carefully reviewed over time, and fees updated, according to the operational costs experienced by businesses. Some governments have intentionally excluded targets when they have introduced their first e-waste regulation. They have left this matter for future revisions of this policy.

25 per cent

Average formal collection and recycling rate for countries with e-waste legislation or policy

Close to zero per cent

Formal collection and recycling rate for countries that have no such policy instruments in place

[15] *The Global E-Waste Monitor, UNITAR & ITU, 2024*

First steps after introducing the regulation

1 Register as many EEE producers as possible

It is good to act quickly after formally issuing the regulation. This signals that the government is proactive and has intent. Waiting too long can be perceived as reactive and unserious. Registering the details of all EEE producers who should comply with the regulation is a positive first step.

Engaging with EEE producers to encourage registration can take several forms. This includes issuing letters to brands operating directly in the country or to associations who might have large numbers of members. These associations might be sectoral such as from the ICT sector, appliances, renewables, or lighting for example.

By tapping into digitalized processes and digital platforms where EEE producers might already be users could increase registrations. This might involve online licensing, company registration or taxation platforms. By creating notifications in processes or alerts in user spaces, awareness can be built.

Incorporating checks at customs with respect to import procedures may also increase registrations. However, these compliance approaches may require significant coordination with other government departments or regulatory authorities.

> ***As Rwanda advances toward a more circular and sustainable economy, the implementation of Extended Producer Responsibility (EPR) has become a cross-cutting policy priority. Institutions beyond traditional environmental agencies are now actively involved in supporting EPR enforcement. The Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA) in collaboration with partners under the CST-ITU project has taken a lead in integrating EPR obligations into sectoral regulations—starting with electrical and electronic equipment. These are primarily focused on product registration and the issuance of business operator licenses for the EEE sector. This facilitates ease of doing business whilst making compliance less costly for government.***
>
> Robert Mugisha, Director of Registration and Licensing Unit, Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA).

2 Actively support the set-up of PROs

The transition to a system with PROs, where there have been none before, can be a challenging step for the EEE-EPR system. It is essential to consider how producers will collaborate, and at what speed, when responding to regulation.

Time can be saved by building capacity during the regulatory development process. One cannot assume that EEE producers have a complete understanding of the EEE-EPR system. One cannot expect companies to be compliant the moment the regulation becomes law. It is important to offer guidance, even training, on what exactly being compliant entails.

Depending on the country, the entities driving the establishment of PROs may not necessarily involve brands, original equipment manufacturers or large producers. In some countries, the initiative is driven by private sector federations or associations.

In others, the EEE producer landscape can take the form of many small importers or distributors. It is therefore important for policy-makers to appreciate what form it will take.

Further information is found in Annex 6.

Questions for entities establishing PROs

- Which EEE producers will champion PRO creation?
- How do you onboard members?
- Where and how will the PRO be housed?
- What will the governance structure look like?
- What will the PRO fee structure look like for members?
- How frequently will EEE-EPR fees be collected and at what point?
- How will the PRO engage with the regulator?
- How will the staff be trained?
- What IT and data infrastructure will be needed?
- How will awareness and outreach be done?

Figure 16. Example of simple PRO budgeting tool

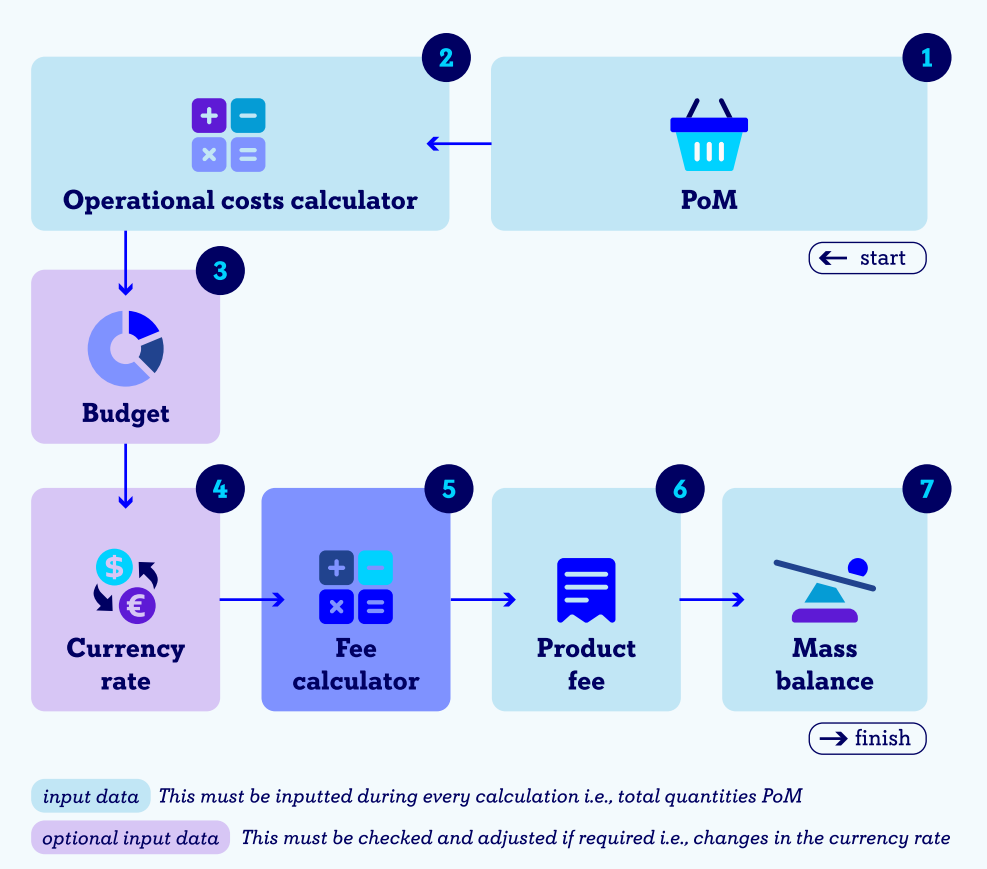


Figure 16 inspired by dss+

3 Provide training and increase capacity

A regulation consists of articles and within these articles are obligations for different stakeholders. Many of the obligations involve the establishment of a particular procedure that stakeholders must carry out. These procedures can relate to enforcement, monitoring or awareness. It is likely that existing staff within government will be taking on new responsibilities or new staff will be hired. All staff will need to be trained. It is also important to initiate capacity building activities for stakeholders, such as EEE producers and e-waste managers. This will help incorporate them into the EEE-EPR system.

4 Raise awareness about the regulation

It is a colossal task to raise public awareness and shift behaviour, so consumers are more responsible towards EEE. Initiatives can focus on highlighting the hazards of e-waste. There can also be targeted campaigns to encourage the deposit of e-waste at collection points. When issuing new e-waste regulations based on the EEE-EPR system, governments may decide to direct communication towards producers in order to let them know about new requirements, which in itself is a form of awareness raising. It can also be helpful to have champion EEE producers, or specific.

Two phases of awareness raising can be considered. The first being the campaign that immediately follows introducing new regulation. The second being the continued outreach and awareness raising needed to boost access to e-waste. This is a concern for the PROs. Operational costs can increase if access to e-waste is difficult. Awareness raising requires investment in various types of media including print, TV, radio and on-the-ground awareness programmes, such as door-to-door campaigns, posters and collection drives. The costs of such initiatives should be factored into the EEE producer's fee. Transparency on actual recycling costs is important, since costs are often passed on to the consumer.

5 Attract international investment

In the case of PROs, initial starting capital often comes from a core group of founding members (as share capita), client advances (as advance fees) or grant funding (from government) - or even a mix of these. Attracting international investment from development agencies, banks and other multilateral agencies can be an important early step in implementing an EEE-EPR system. This step can be made easier by demonstrating that a well-developed framework is in place setting out rules and systems. Investment will be easier if the system is ready to embark on implementing EEE-EPR already, with the commitment of champion EEE producers in place.

6 Consider harmonization at a regional level

Where possible, governments should seek to harmonize their regulations with those of neighbouring countries. If regional economic communities, common markets or associations of countries exist efforts should be made to align key provisions within these regions. Facilitating international harmonization can make monitoring among countries much easier for regulators. This can also make compliance simpler and cheaper for producers.
Harmonization can be particularly valuable in regions where the same EEE producers are placing the same branded products on the markets of neighbouring countries and where regional economies of scale are needed to make recycling business sense. This is particularly true when countries with small populations are adjacent to those with large populations.

Key provisions that can be harmonized:

- EEE-EPR registration frameworks and platforms for EEE producers
- Type and nature of producer responsibility schemes
- Measurement frameworks for e-waste data collection
- Definitions of EEE producers and other key stakeholders
- Categorization of products and product scope included
- Stakeholder roles and responsibilities and their obligations
- Procurement and asset disposal rules for government
- Voluntary or mandatory standards for e-waste treatment

7. Country profiles

Click on the country of your choice

The case studies in the country section profile the e-waste management practices of Paraguay, Rwanda, Zambia and the Kingdom of Saudi Arabia.

This information, reflecting in-country activity in recent years, provides a detailed picture of the current e-waste status in each country, along with findings and impact as a result of implementation of the project. Tools undertaken and developed in the country through the project are also presented.

7.1 Paraguay

The e-waste policy and regulatory status

Overarching law: Law No. 3956/2009 on the Integrated Solid Waste Management and its regulatory decree 7.391/2017, as well as resolutions 355 and 356 of 2020.

It includes e-waste within the classification of solid waste, as special handling waste.

However, a comprehensive EEE-EPR system for e-waste is still absent in Paraguay.

Core support through the project:

- Development of a specific legal framework to establish a post-consumer management system for EEE and the principle of EEE-EPR.

In 2022, Paraguay generated 57,000 tonnes of e-waste. The country records an average of 8.4 kg of e-waste generated per capita, exceeding the global average of 7.8 kg per capita. According to the Ministry of Environment and Sustainable Development of Paraguay, this is largely due to cross-border EEE purchasing tourism driven by lower prices compared to neighbouring countries.

Facts and figures[16]

57,000 tonnes of e-waste generated in 2022

8.4 kilograms of e-waste per capita in 2022

Formal collection rate not known

Over 100 individuals directly consulted on the draft regulations[17]

More than 35 different organizations from the public and private sectors, academia and civil society were represented

90 per cent > How relevant workshops were to surveyed participants, concerning their areas of work

84 per cent > Average rating of the achievement of workshop objectives by surveyed participants

[16] *The Global E-Waste Monitor, UNITAR & ITU, 2024*
[17] *Data provided from ITU stakeholder engagement analysis*

Project timeline and outputs for Paraguay

October 2024

- Consultation with government
- Consultation with EEE industry

May 2025

- EEE industry EPR engagement and capacity building session
- Consultation with stakeholders, including the EEE industry
- Pre-validation workshop on draft regulation

Until December 2025

- Finalization of draft legal framework/ regulation
- Further industry engagement and capacity building

April 2025

- Consultation on the EEE-EPR financing study on the e-waste sector

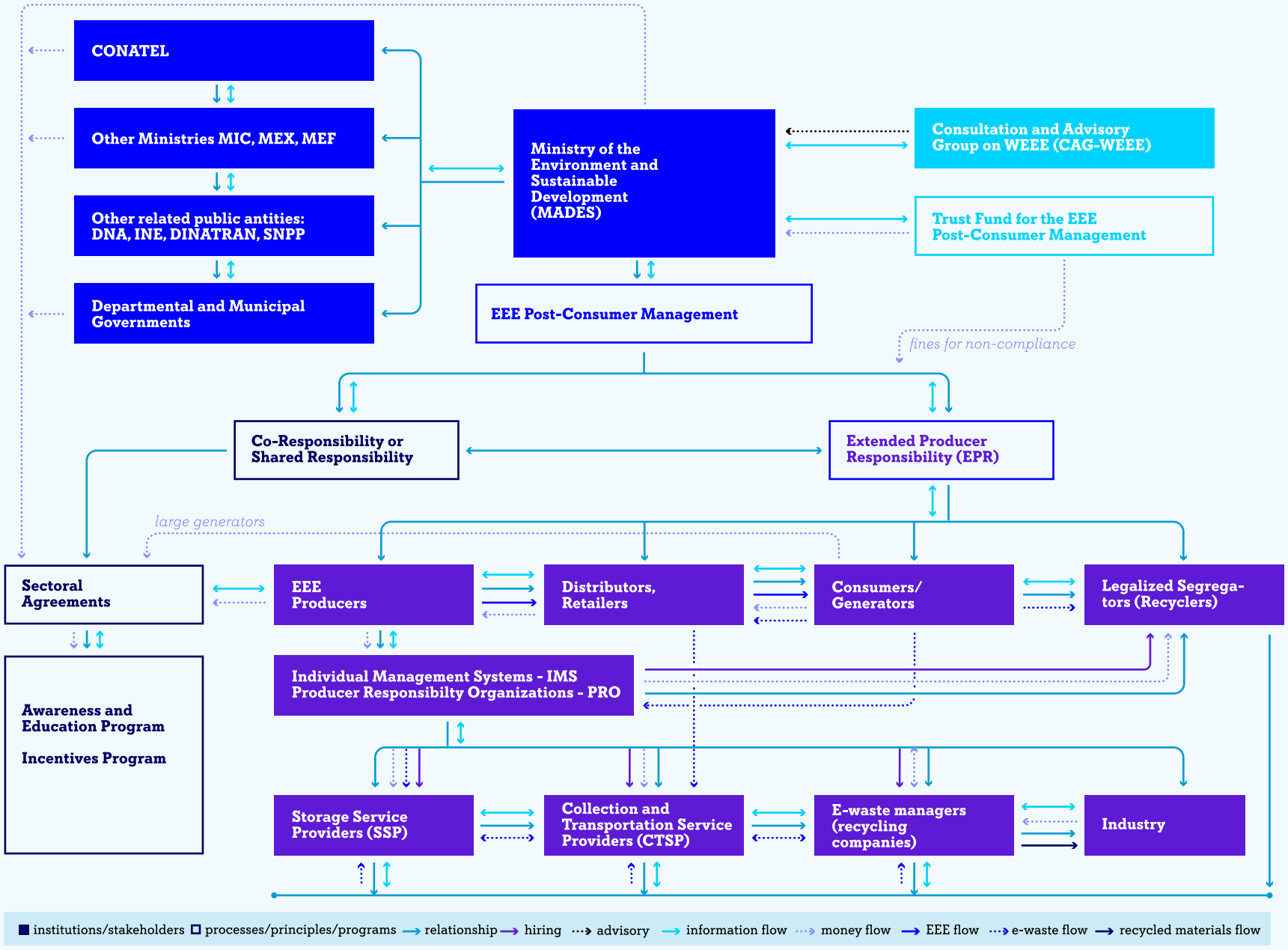
September 2025

- Delivery of EEE-EPR financing study on the e-waste sector

Project outputs

1. **Draft legal framework**
2. **Study into the cost of e-waste management**
3. **EEE producer engagement and capacity building**

Figure 17. Paraguay - Scoping the post-consumer EEE management system



Description of the post-consumer EEE management system

Examples of proposed roles and responsibilities are as follows:

Government

- Maintain an annual national inventory of e-waste and its sources of generation
- Evaluate, approve and register PRO plans and authorize PROs once their plans are approved and registered
- Receive and evaluate reports from PROs and service providers
- Prevent the emergence of free riders
- Encourage the creation and development of service providers, as well as cooperatives of legalized recyclers
- Carry out oversight actions and apply sanctions
- Register EEE producers, distributors and retailers
- Organize data on the categories, quantities, weight, brands of EEE produced, distributed and traded
- Regulate EEE labelling
- Register importers
- Issue a certificate of origin of EEE, exert oversight and control on the illegal importation of new and used EEE
- Maintain statistics on the consumption of new and used EEE
- Report data on quantities, weight, brands, usage time, consumption trends and estimates of average lifespan
- Verify and validate the information reported by stakeholders

EEE producers

- Register with the PRO that the producer belongs to
- Bear costs for the post-consumer management of EEE and other responsibilities
- Meet established targets
- Provide information to waste managers

Retailers

- Accept e-waste regardless of its brand and at no cost to the consumer
- Provide drop-off units for e-waste located at points of sale

PROs (multiple)

- Hire the registered and authorized parties required to carry out the proper post-consumer management of EEE
- Establish an effective collection system, finance it, and if necessary, operate it, as well as inform consumers of its existence
- Formulate and submit a comprehensive e-waste management plan for approval and registration by the regulatory authority

Consumers

- Segregate e-waste
- Deliver e-waste to collection sites

Registered recyclers

- Issue monthly certifications of e-waste management
- Submit quarterly report to regulatory authority
- Apply audit formats and reports any modifications to regulatory authority.

Importance of co-responsibility / shared responsibility in Paraguay

Paraguay aims to implement the concept of co-responsibility for e-waste management. This concept implies that the generator of e-waste or the entity causing present or future environmental degradation is responsible, along with the relevant authorities, for the costs of preventive or corrective actions to restore the environment. Each stakeholder is expected to assume responsibility for a specific stage of e-waste management. Implementation is conducted through sectoral agreements, which establish shared but differentiated responsibilities.

Assessing e-waste management costs

A true assessment of the costs is crucial before making assumptions about the financial implications on consumers, retailers or producers.

Figure 18. Costing template for e-waste recyclers

Reporting period
From (dd/mm/yyyy): .....
To (dd/mm/yyyy): .....

	E-waste treatment			
E-waste category	**List of E-waste handled** **List of equipment handled under each category during the reporting period**	**Quantity of E-waste handled** **Total E-waste handled under each category during the reporting period (tonnes)**	**Labor cost per tonne** (total labor cost/tonne of equipment handled per category) *[to estimate labor cost: identify labor expenses, calculate total wages (workers x hours x rates)]*	**Energy costs pe** (total energy co of equipment...) *[to estimate ene ....]*
1. Temperature exchange equipment (refrigerators, freezers, air conditioners, and heat pumps)	1. ..... 2. ..... 3. ..... 4.			
2. Screens and monitors (televisions, monitors, laptops, notebooks, and tablets)	1. ..... 2. ..... 3. ..... 4.			
3. Lamps (fluorescent, high-intensity discharge, and LED lamps)	1. ..... 2. ..... 3. ..... 4.			
4. Large equipment (washing machines, dishwashers, copying equipment, and photovoltaic panels)	1. ..... 2. ..... 3. ..... 4.			
5. Small equipment (vacuum cleaners, microwaves, toasters, electic kettles, electric shavers, electrical and electronic toys)	1. ..... 2. ..... 3. ..... 4.			
6. Small IT and telecommunication equipment ([mobile] phones, routers, personals computers, and printers)	1. ..... 2. ..... 3. ..... 4.			
	Total e-waste treatment cost			

It is essential to consider Paraguay's country and value chain context.

Table 13. Paraguay country and value chain context

Examples of country context	Examples of value chain context
Population concentration in rural and urban areas	Availability of elements and supplies for the mobilization of e-waste
Consumption of EEE across different categories	Existence and potential creation of service providers for storage, collection, transportation and e-waste management
Manufacturing, importing and assembling of EEE	Study of the stages of e-waste management that can be developed at the national level
Reuse habits of EEE by category	E-waste management options at the international and regional levels
Current handling of e-waste and the role of the informal sector	
Identification of existing individual initiatives for e-waste management	
Road and transport infrastructure	

In the news

- Paraguay seeks greater efficiency of post-consumer electrical and electronic equipment (EEE)
- Paraguay aims to develop new e-waste regulations
- MADES and CONATEL promote workshops on responsible electronic waste management in Paraguay
- International consultants from the ITU visit the INE to advance the measurement of e-waste in Paraguay

7.2 Rwanda

The e-waste policy and regulatory status

Overarching law and instruments:

- Law No. 24/2016 of 18/06/2016 Governing Information and Communication Technologies
- Law No. 48/2018 of 13/08/2018 on Environment
- Regulation No. 002 of 26/4/2018 Governing E-waste Management in Rwanda
- National E-waste Management Policy for Rwanda, August 2018
- National Circular Economy Action Plan and Roadmap (2022 - 2035)

The laws establish a clear legal framework for the management of e-waste in Rwanda, emphasizing environmental protection and public health. Article 20 of the Law on Environment calls for environmentally sound management of e-waste and requires its disposal only through approved facilities. Article 130 of the Law Governing Information and Communication Technologies provides a regulatory mandate on e-waste management to the designated regulatory authority, which is currently the Rwanda Utilities Regulatory Authority (RURA). The RURA regulation Governing E-waste Management in Rwanda provides the framework for the development and implementation of EEE-EPR to ensure the efficient management of e-waste.

New regulations specific to EEE / e-waste and EPR (supported through the project):

- Regulation No. 5/2022 of 07/07/2022 governing Trade of Used Electrical and Electronic Equipment
- Draft regulation governing E-waste Management in Rwanda
- Draft regulation No. XX of XX/XX/2025 governing Electrical and Electronic Products

Rwanda has made great steps forward in addressing e-waste management. The 2018 regulations under the custodianship of RURA defines EEE producers and sets specific obligations for the EEE producer to ensure effective take-back and treatment of e-waste. It is undergoing revision so that it is tailored to the implementation of the EPR system. Additionally, a regulation on the trade of used EEE is in place since 2022, under the custodianship of the Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA). This regulation ensures the controlled circulation of these products in the market.

RICA is also in a consultation process on a new regulation governing EEE with the objective of compliance with safety and energy efficiency of EEE. This also involves the capture of EEE producer information through registration with the EEE-EPR system. Once updated, these regulations will equip Rwanda with strengthened processes for EPR implementation and compliance.

Facts and figures[18]

10,000 tonnes of e-waste generated in 2022

0.7 kilogram of e-waste per capita in 2022

20 per cent formal collection rate in 2022

Over 2,500 EEE producers were identified in Rwanda[19]

Almost 30 companies identified as "champion EEE producers" to launch Rwanda's e-waste PRO

98 per cent > How relevant workshops were to surveyed participants, concerning their areas of work

93 per cent > Average rating, given by participants, on whether workshop achieved its objectives

[18] *The Global E-Waste Monitor, UNITAR & ITU, 2024*
[19] *Data provided from ITU stakeholder engagement analysis*

Project timeline and outputs for Rwanda

June 2024

- Initial defining of the EPR service for EEE and its high-level architecture

July 2024

- Drafting and consultation of national EEE-EPR implementation guide for EEE

November 2024

- Initial EEE producer outreach and engagement on EEE-EPR
- Consultation on PRO set-up and costs of EEE-EPR system
- Senior management briefings on EEE-EPR system progress

March 2025

- Validation workshop of RICA technical regulations on EEE
- Continued EEE producer outreach and engagement on EEE-EPR
- Further refining the digital elements of the EPR service for EEE

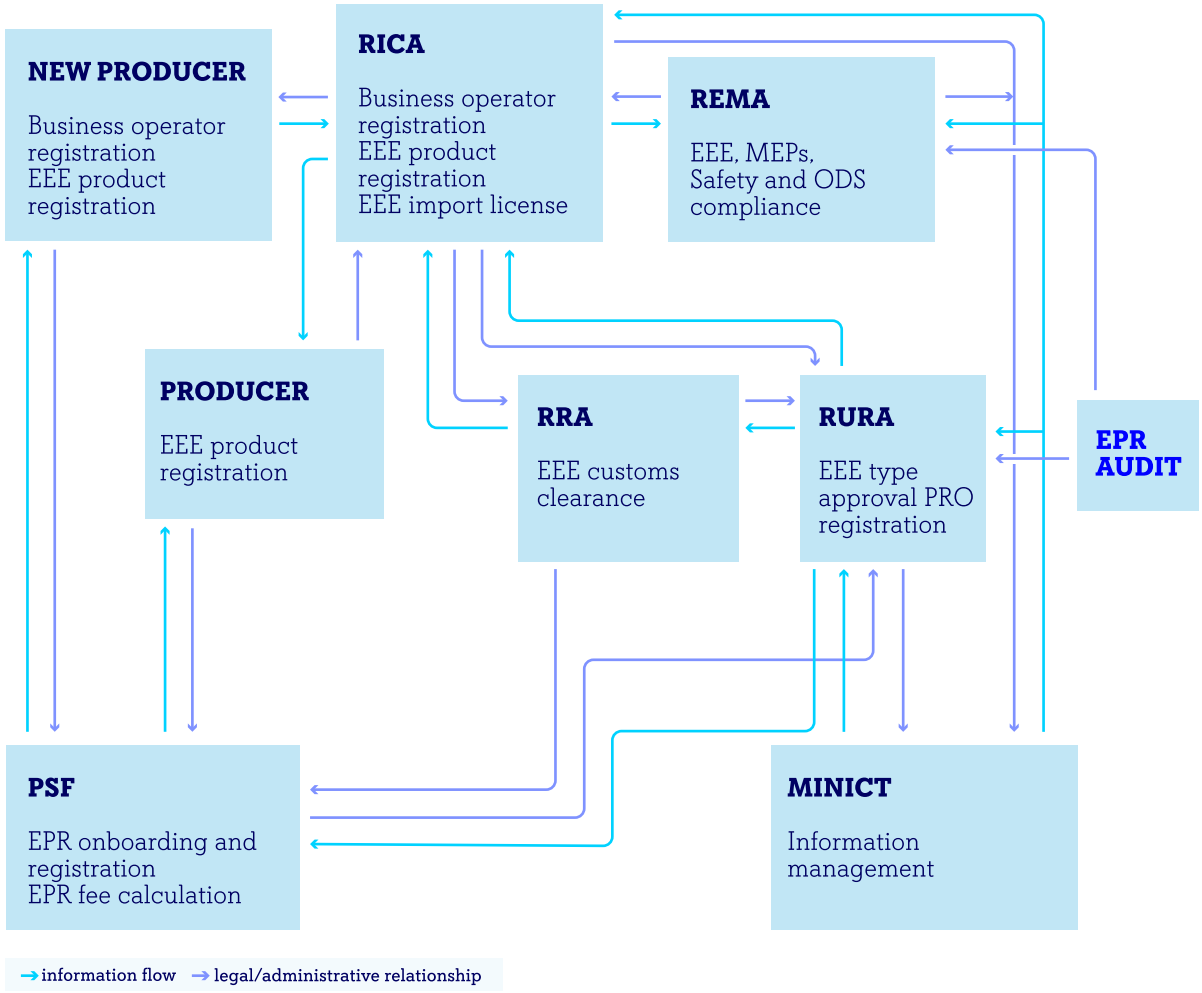
Until December 2025

- Finalizing PRO membership engagement
- Establishing clearer requirements for the producers
- Publishing national EPR guidelines for the EEE sector

Project outputs

1. **Draft revised EPR legal framework for the EEE sector**
2. **EEE-EPR implementation guidelines**
3. **Set up of national PRO for the EEE sector**
4. **EEE producer engagement and capacity building**
5. **Financial mechanism for EEE sector EPR**

Figure 19. Rwanda - Scoping the post-consumer EEE management system



The Business Research Centre, which is housed under the Private Sector Federation, has been identified as Rwanda's PRO, and is in charge of mobilizing the active engagement of the private sector. A self-functioning PRO is essential, and the right tools are critical to ensure EEE producers' EPR fees are calculated correctly and efficiently.

Description of the post-consumer EEE management system

Examples of proposed roles and responsibilities are as follows:

Government

Rwanda Inspectorate, Competition and Consumer Protection Authority

- Issue business operator license to EEE producers
- Register EEE products placed on market in Rwanda
- Issue EEE import permit
- Oversee compliance of EEE with standards and safety requirements

Rwanda Environmental Management Authority

- Oversee compliance of EEE products with minimum environment performance standards (MEPs), safety and presence of ozone depleting substances (ODS) in products.

Rwanda Utilities Regulatory Authority

- Be responsible for type approval procedures for EEE
- Oversee PRO registration

Rwanda Revenue Authority

- Perform EEE customs clearance

EEE producers

- Assume the costs of collecting and managing e-waste
- Register with the PRO for EEE products
- Meet established targets
- Provide information to waste managers

PRO (single)

- Register with RURA
- Comply with collection and recycling targets for each identified regulated waste stream
- Develop and maintain a system to collect the EPR fee from producers
- Develop and maintain a register of its members
- Contract for the collection and transportation, dismantling and refurbishment and treatment with licensed service providers through a fair and transparent process
- Conduct communications and awareness raising activities to increase awareness about e-waste and to boost e-waste collection rates
- Produce quarterly and annual reports to RURA and PRO governance board

Consumers

- Ensure that e-waste is segregated from other forms of waste and is taken to licensed facilities
- Ensure that e-waste is not resold or auctioned or exchanged or donated except to a licensed facility

Registered recyclers

- Maintain records of e-waste recycled and make such records available for scrutiny upon request by RURA
- Ensure that their operations are in accordance with environmental standards in terms of emissions, effluents, noise for e-waste treatment and disposal
- Ensure that e-waste management processes do not have any adverse effect on human health and the environment

In the news

- Actively engaging Rwanda's private sector in e-waste management
- Promoting effective e-waste regulation in developing countries
- Rwanda's journey towards promoting circular economy

Providing efficient services

Unique to Rwanda is the "3-in-1 service," which is currently being put in place and would be made available through Irembo - a digital government services platform. This is through one regulation, now in draft, No. XX of XX/XX/2025 Governing Electrical and Electronic Products, it combines three processes making compliance easier for EEE producers, which involves:

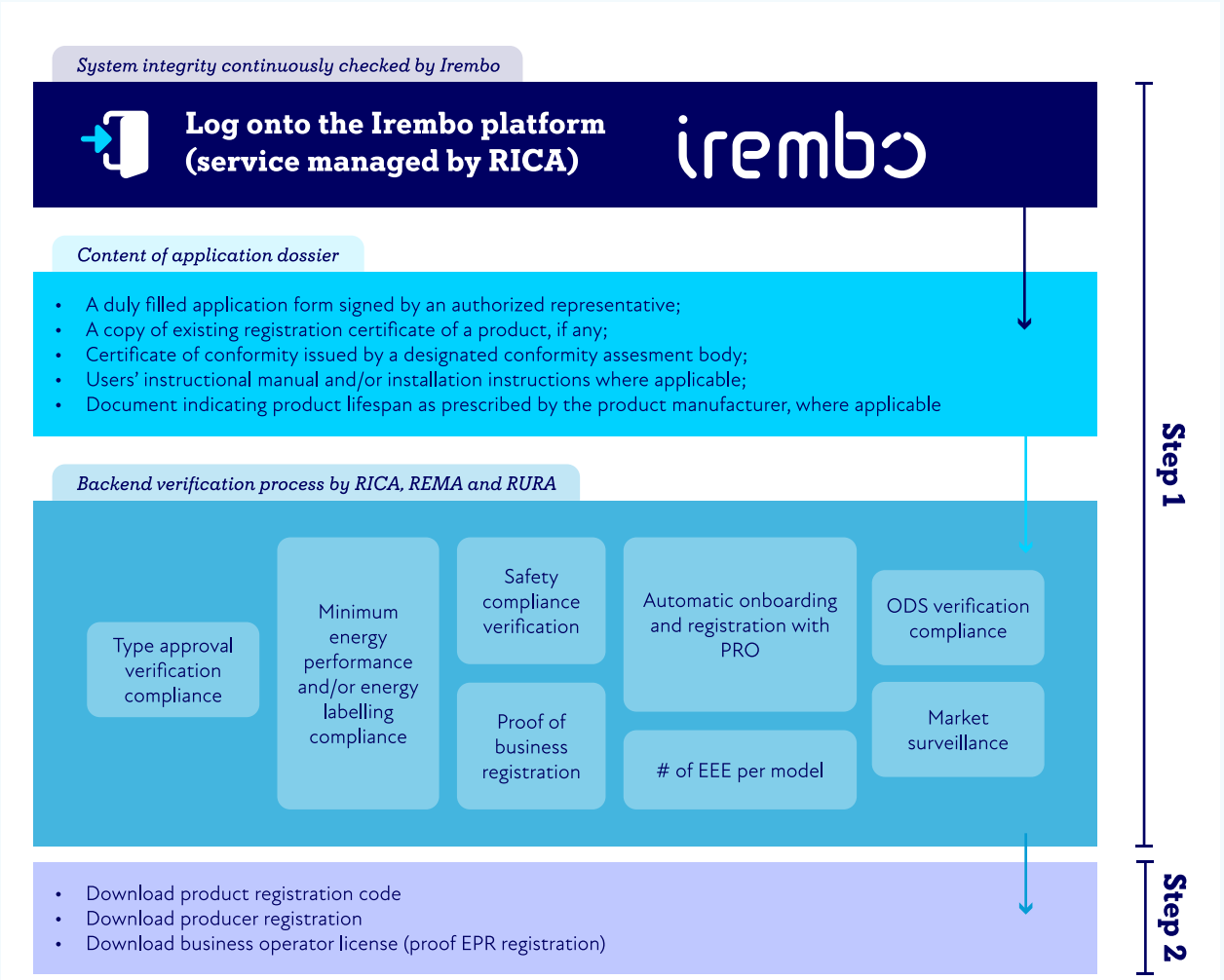
1. Business permits to deal in the EEE sector
2. Product registration for certain EEE
3. Automatic PRO membership.

This will bring about:

- Reduction in administrative costs for EEE producers
- Reduction in transaction time for EEE producers
- Increased transparency and collaboration among regulators
- Improved enforcement, curtailing free-riding producers.

The 3-in-1 service will eventually interface with other regulatory frameworks that have their own jurisdiction such as Ozone Depleting Substances, Minimum Energy Performance and Type Approval.

Figure 20. Rwanda - Profile of Irembo digital platform for RICA



7.3 Zambia

The e-waste policy and regulatory status

Overarching law:

- Act No. 12 of 2011 The Environmental Management Act
- Statutory Instrument No. 65 of 2018 Environmental Management (Extended Producer Responsibility) Regulations

Zambia has adopted several overarching instruments applying to e-waste. *Statutory Instrument No. 65 on Extended Producer Responsibility Regulations (2018)* is a legally binding instrument that regulates extended producer responsibility (EPR) but it has been infrequently implemented. The government has begun preparing a specific regulation on e-waste management and in 2023 it started developing a specific EPR regulation covering electronics and packaging materials.

New laws specific to EEE / e-waste and EPR (supported through the project):

- Draft Statutory Instrument: Environmental Management (Extended Producer Responsibility) Regulations
- Draft Statutory Instrument: Environmental Management (E-waste Management) Regulations

Facts and figures[20]

23,000 tonnes of e-waste generated in 2022

1.1 kilogram of e-waste per capita in 2022

Formal collection rate of e-waste is unknown

Over 220 stakeholders consulted on the EPR system from 2023 to 2025[21]

More than 30 different organizations represented in consultations

[20] *The Global E-Waste Monitor, UNITAR & ITU, 2024*
[21] *Data provided from ITU stakeholder engagement analysis*

Project timeline and outputs for Zambia

October
2023

- Consultation on new regulations with government

June
2024

- Kickstart of the EEE-EPR financing study
- Initial EEE producer engagement and capacity building session

Until December
2025

- Completion of the voluntary EEE-EPR scheme manual
- Completion of the guidelines on EEE-EPR for the ICT sector

March
2024

- Consultations on new regulations with EEE producers

February
2025

- Continued producer engagement and capacity building session
- Completion and presentation on financing study results

Project outputs

1. Consultation into the revised EPR regulations for the EEE sector
2. EPR implementation guidelines specifically for the ICT sector
3. Voluntary EPR scheme manual for ICT sector PRO set up
4. Study into the cost of e-waste management
5. EEE producer engagement and capacity building

Scoping the post-consumer EEE management system

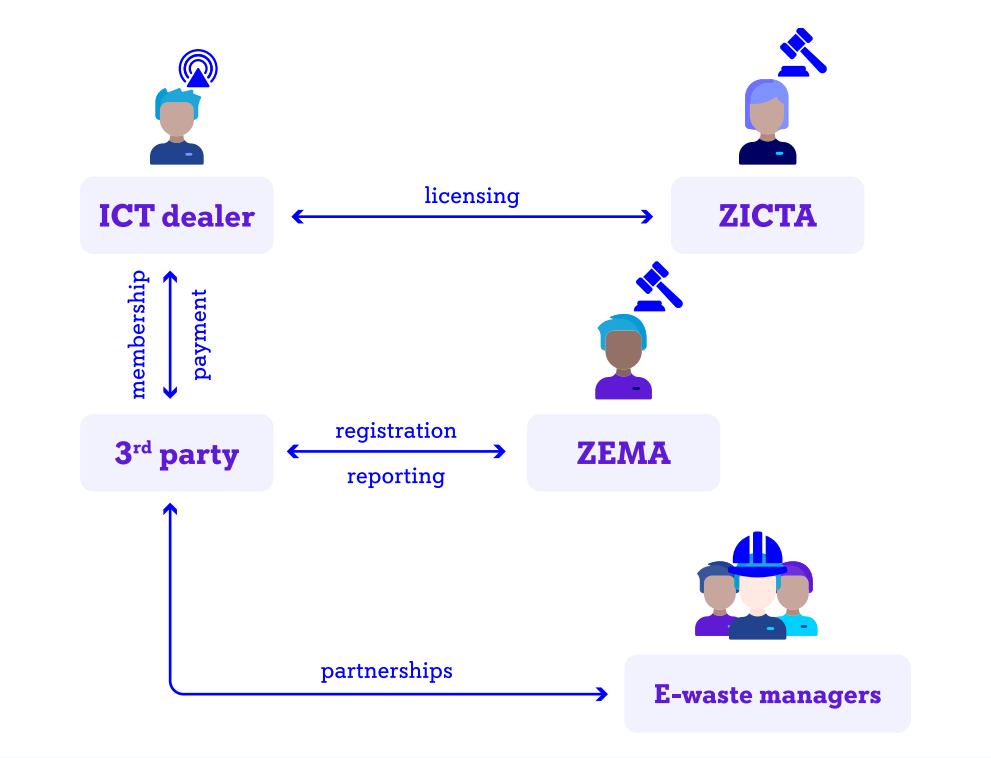
Zambia is currently taking steps to better regulate and enforce a nationwide EPR system for EEE. There are now options to establish sectoral PROs. The ICT sector has also been preparing for new compliance measures, which will be enforced in the years to come.

Although not activated yet, the potential to include new licence provisions for ICT dealers is being explored. In Zambia, many ICT dealers are also EEE producers within in the EEE-EPR system.

The potential license provisions for ICT dealers involve complying with laws related to EEE-EPR and e-waste and are as follows:

- Provide e-waste drop-off points compliant with standards set by the environment regulator
- Hold correct documentation on the e-waste management chain
- Accept ICT e-waste free of charge from consumers regardless of brand or origin of purchase
- Partner with or contract environment regulator-compliant e-waste management companies
- Provide reports on volumes of e-waste generated and collected
- Promote responsible e-waste management and raise customer awareness
- Become a member of a PRO if required by the environment regulator.

Figure 21. Zambia - Map of EEE and e-waste actors and processes



Understanding e-waste management costs in Zambia

Most of the equipment available in Zambia is imported by agents or distributors who often operate under agreements with overseas manufacturers. In many cases, these importers need to assume the role of "producer" within the EEE-EPR framework. This will ensure compliance within the EEE-EPR system, once it is formally established.

Under new regulations each producer of EEE will be responsible for financing the collection, transport and treatment of household e-waste. This will involve certain costs such as accessing e-waste, transporting it and treating it.

When such costs occur, the responsibility for financing the management of e-waste will fall on all EEE producers operating on the market. It is anticipated that each producer contribution will be proportional to their market share within each EEE category.

Table 14. Zambia - Estimated e-waste management costs

E-waste management costs per year		2025	2026	2027	2028	2029	2030	2031	2032
Temperature exchange equipment	USD	-	504.480	658.449	830.548	1.013.723	1.160.065	1.291.096	1.430.201
	ZMW	-	13.275.802	17.327.597	21.856.533	26.676.923	30.528.016	33.976.201	37.636.863
Screens and monitors	USD	-	504.480	658.449	830.548	1.013.723	1.160.065	1.291.096	1.430.201
	ZMW	-	1.803.570	2.781.882	3.845.707	4.675.876	5.466.644	6.303.653	7.195.170
Large equipment	USD	-	70.042	98.310	158.196	221.306	268.520	306.051	330.994
	ZMW	-	1.843.198	2.587.102	4.163.041	5.823.834	7.066.306	8.053.970	8.710.369
Small equipment	USD	-	95.995	120.778	149.279	180.405	210.504	245.287	283.443
	ZMW	-	2.526.175	3.178.360	3.928.408	4.747.491	5.539.591	6.454.931	7.459.032
Small IT and telecommunication equipment	USD	-	185.082	202.429	259.111	283.541	304.615	330.853	359.711
	ZMW	-	4.870.588	5.327.077	6.818.717	7.461.600	8.016.171	8.706.659	9.466.074
Total	**USD**	**-**	**924.135**	**1.185.677**	**1.543.271**	**1.876.658**	**2.151.436**	**2.412.826**	**2.677.765**
	ZMW	**-**	**24.319.333**	**31.202.016**	**40.612.406**	**49.385.724**	**56.616.728**	**63.495.415**	**70.467.507**

Reference: GreenForest Solutions GmbH

Table 15. Zambia - Estimated EEE producer fees

Producer fee per tonne PoM		2025	2026	2027	2028	2029	2030	2031	2032
Temperature exchange equipment	USD	11	69	86	101	117	124	134	145
	ZMW	278	1.816	2.263	2.660	3.066	3.270	3.537	3.817
Screens and monitors	USD	11	53	74	93	107	117	129	142
	ZMW	278	1.402	1.957	2.455	2.814	3.074	3.397	3.730
Large equipment	USD	11	30	38	49	60	65	69	71
	ZMW	278	796	999	1.282	1.573	1.712	1.826	1.874
Small equipment	USD	11	27	32	35	38	38	40	41
	ZMW	278	721	853	918	991	998	1.044	1.092
Small IT and telecommunication equipment	USD	11	48	52	60	63	62	64	66
	ZMW	278	1.251	1.368	1.576	1.647	1.641	1.684	1.732
Average total E-waste	**USD**	**11**	**46**	**56**	**66**	**75**	**78**	**83**	**88**
	ZMW	**278**	**1.219**	**1.481**	**1.737**	**1.962**	**2.065**	**2.194**	**2.317**

Reference: GreenForest Solutions GmbH

In the news

- Zambia advances e-waste management through extended producer responsibility (EPR initiative)
- ITU and Saudi Arabia boost Zambia e-waste policy
- Mutati calls for collective action in e-waste management

7.4 Kingdom of Saudi Arabia

National level initiative status

The Kingdom of Saudi Arabia is witnessing a growing opportunity to value e-waste and sustainably manage it. Momentum is building through several initiatives like the ''Recycle Your Device'' initiative, whose achievements are featured below. Additionally, a memorandum of understanding has been signed between the Communications, Space and Technology Commission (CST) and the National Center for Waste Management (MWAN), aiming for a 90 per cent e-waste recycling rate by 2040. Complementing these efforts is the Unified Charging Ports Initiative, which seeks to reduce e-waste at the source by standardizing device charging infrastructure.

'Recycle Your Device' initiative

An initiative launched in December 2022 by CST in cooperation with the Ministry of Communications and Information Technology, MWAN and the private sector to encourage businesses and individuals to recycle their electronic devices.

Recycle Device

The campaign aims to help the Kingdom of Saudi Arabia achieve the Sustainable Development Goals in both the near- and medium-term.

The initiative has two broad aims:

1. Raise awareness among individuals and institutions to recycle electronic devices and be more sustainable
2. Expand partnerships with the private sector in order to create a broader national recycling movement

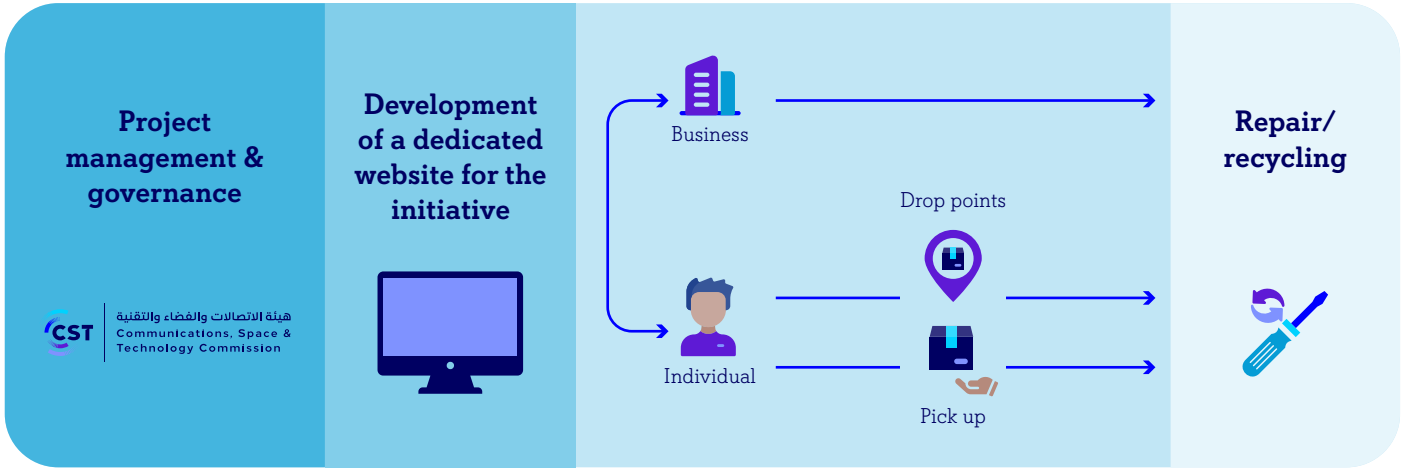
[20] *The Global E-Waste Monitor, UNITAR & ITU, 2024*
[21] *Data provided from ITU stakeholder engagement analysis*

The initiative succeeded through the diversity of partners from the public and private sectors, which facilitate its implementation, endowed it with flexibility, and offered multiple ways of participation while providing diverse incentives for participants. This led to the achievement of its economic, environmental and social goals by creating value for devices that previously had no value.

Supervision & governance

4 **instructional guides** — To raise awareness

24hr **customer support** — Receiving inquiries from participants



Achievements

First national initiative
In recycling electronic devices

+350K
Collected devices

+75M SAR
Market value of the devices

+840 tons
Recycled or repaired

+150
Charities and schools were supported

+70K
Individual contributions

26
Visited entities to encourage and rise awareness

+100
Entities have made donation of their devices

8. Summary

This toolkit serves as a comprehensive guide for policy-making in e-waste management. By providing detailed instructions and best practices, it will empower policy-makers to develop and implement fair and economically viable EEE-EPR regulation to address e-waste. Over 400 stakeholders have been engaged and consulted in a process of inclusive policy-making. This involved the governments of Paraguay, Rwanda and Zambia, as well as industry stakeholders in these countries.

The ten recommendations from this toolkit include:

1. **Map out the EEE-EPR system** for e-waste management. This should be done while regulation is being drafted. Don't wait until it becomes law. Think about how the EEE-EPR system will be implemented early on. It's crucial to define roles and responsibilities. It is also important to fully understanding how money, information and materials will move in the system.

2. **Identify and engage EEE producers from the outset.** How this is done matters, so determine which sources could provide the connections and the access to companies active in this sector *en masse*.

3. **Develop EEE-EPR regulation alongside producers.** It is a collective responsibility of both government and industry to define what regulation will do and how it will be implemented. EEE producers are more likely to comply with laws that they have been consulted on and are familiar with.

4. **Clearly define terms for the EEE-EPR system**, since definitions are extremely important. Without them each stakeholder does not know where they stand. Blurry definitions lead to inefficient implementation. Clear definitions are too often overlooked in policy-making. Yet they are a core component to regulation and give meaning to all actors and processes.

5. **Establish a well-defined product scope and category definitions.** Policy-makers must ensure that the products included in the scope of the regulation are clear. There must be a clear link between the definition and categorization of EEE products and e-waste. For example, if a smart phone is defined as EEE in the regulation then when it becomes e-waste, the whole of that product must also be defined in the regulation, not just its potentially hazardous components. Policy-makers must also harmonize product categories in their regulations with those in neighbouring countries.

6. **Investigate the true cost of e-waste management** by studying the technical and framework costs in your country. Do this before making assumptions that an EEE-EPR fee for producers or an advanced recycling fee for consumers will be too costly. Too often this step is left out. Therefore the typical argument around high costs is unfounded until there is data.

7 **Prescribe EEE-EPR requirements in existing procedures**, especially for producers. Look at existing regulation before developing obligations in new policies. The registration of EEE producers in the EEE-EPR system is a good example of a provision that can be included in existing company requirements. This can be established alongside other obligations relating to taxation, company registration or business permits.

8 **Break up the challenge into bite-size chunks** by addressing the legal, administrative and financial issues as separate components. This is because the drafting of regulation that establishes a fair and economically viable EEE-EPR system can be a significant challenge, even for a well-resourced government department.

9 **Take time to think about the type of EEE-EPR system** to be implemented. It is crucial to consider local context. Cultural and geographical factors can also be very important, since they significantly influence the roles and responsibilities adopted by stakeholders, the cost of the e-waste management system, and the way the PROs will operate.

10 **Move swiftly after the regulation becomes law.** As a policy-maker, the job is only just beginning. Register as many EEE producers as possible, actively support the set-up of the PROs, provide training and increase capacity, raise awareness about regulation and attract international investment.

The collaborative efforts and insights from Paraguay, Rwanda and Zambia highlight the importance of a holistic approach to EEE-EPR policy-making. As many countries move towards a circular economy, it is crucial to ensure that e-waste is managed responsibly and sustainably, protecting both the environment and human health and retaining critical raw materials.

9. Annexes

Annex 1. Samples of product scope (will continue on next page)

Country	Product scope
Australia	Consumer/entertainment electronics; office, information and communications technology products; household appliances; lighting devices; power tools excluding stationary industrial devices; devices used for sport and leisure, including toys. Product stewardship applying to television and computer products and by-products.
Republic of Colombia	Household appliances; electronics and telecommunications equipment; machinery and electrical equipment.
Dominican Republic	Temperature exchange equipment; monitors, screens and devices with screen surfaces larger than 100 cm^2; lighting equipment with independent use; large equipment; small equipment; small ICT equipment.
Republic of India	Information, technology and telecommunication equipment; consumer electrical and electronics as well as photovoltaic panels; large and small electrical and electronic equipment; electrical and electronic tools (with the exception of large-scale stationary industrial tools); toys, leisure and sports equipment; medical devices (with the exception of all implanted and infected products); laboratory instruments.
Japan	Refrigerators and freezers, air conditioners, televisions, washing machines and dryers under the Home Appliance Recycling Act. Small household equipment (all household electronics except the four categories in the Home Appliance Recycling Act) under the Small Home Appliance Recycling Act.
Nigeria	Large household appliances; small household appliances; IT and telecommunications equipment; entertainment and consumer equipment; lighting equipment; electrical and electronic tools (with the exception of large-scale stationary industrial tools); toys, leisure and sports equipment; medical devices (with the exception of all implanted and infected products); monitoring and control instruments; automatic dispensers.
Peru	Large household appliances; small household appliances; IT and telecommunications equipment; consumer electrical appliances; lighting equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices and clinical laboratory equipment; monitoring and control equipment; vending machines; photovoltaic panels.

Country	Product scope
Rwanda	Small household appliances; large household appliances; IT and telecommunications equipment consumer equipment; lighting equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices (with the exception of all implanted and infected products); monitoring and control instruments; automatic dispensers; batteries; security and military equipment; fluorescent tubes.
Singapore	ICT equipment; large appliances; lamps; batteries; solar PV panels.
Republic of South Africa	Large household appliances; small household appliances; office, information and communication equipment; entertainment and consumer electronics and toys; leisure, sports and recreational equipment; automatic issuing machines; lighting equipment; electric and electronic tools; security and health care equipment; mixed e-waste.

Annex 2. Samples of stakeholder definitions (will continue on next pages)

Country	Stakeholder	Definition
Rwanda	**Consumer**	User of EEE.
	Manufacturer	A local or international entity involved in the making or production of EEE.
	Producer	Any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler.
	Transporter	A person or entity that is willing to carry or conveying e-waste from one point to another.
South Africa	**Brand owner**	A person, category of persons or company who makes and/or sells any product under a brand label.
	Free rider	A firm or individual who benefits from the actions or efforts from another, in relation to an extended producer responsibility scheme, without sharing or paying the costs.
	Importer	A person or category of persons that brings finished goods or their individual components into the country from abroad.
	Producer	Any person or entity who, (i) manufactures and offers to sell electrical and electronic equipment and their components or consumables or parts or spares under its own brand; or (ii) offers to sell under its own brand, assembled electrical and electronic equipment and their components or consumables or parts or spares produced by other manufacturers or suppliers; or (iii) offers to sell imported electrical and electronic equipment and their components or consumables or parts or spares; or (iv) who imports used electrical and electronic equipment; irrespective of the selling technique used such as dealer, retailer, e-retailer, etc.

Country	Stakeholder	Definition
Malawi	**Producer**	An entity that introduces new or used EEE, products into the country using authorized means by manufacturing, assembling, importing, distributing, converting, selling and or reselling.
Zambia	**Producer**	A person who intends to manufacture, retail, import, trade or commercially distribute an EEE product in Zambia.
Chile	**Seller**	Any natural or legal person, other than the producer, which sells a priority product to the consumer.
	Industrial consumer	Any industrial establishment, in accordance with the General Urban Planning and Construction Ordinance, that generates waste from a priority product.
	Distributor	Any natural or legal person, other than the producer, which markets a priority product before its sale to the consumer.
	Generator	Holder of a product, substance or object who discards it or is required to discard it in accordance with current regulations.
	Manager (waste)	Natural or legal person, public or private, that carries out any of the waste management operations and is authorized and registered in accordance with current regulations.
	Producer	A person that, regardless of the marketing technique, a) sells a priority product for the first time on the national market. b) sells a priority product purchased from a third party other than the primary distributor under their own brand. c) imports a priority product for their own professional use.
	Basic recycler	A natural person that, through the use of artisanal and semi-industrial techniques, is directly and regularly engaged in the selective collection of household or similar waste and in the management of reception and storage facilities for such waste, including its classification and pretreatment. Legal entities comprised exclusively of natural persons registered as basic recyclers, in accordance with Article 37, shall also be considered basic recyclers.
Republic of India	**Producer**	Any person or entity who, (i) manufactures and offers to sell electrical and electronic equipment and their components or consumables or parts or spares under its own brand; or (ii) offers to sell under its own brand, assembled electrical and electronic equipment and their components or consumables or parts or spares produced by other manufacturers or suppliers; or (iii) offers to sell imported electrical and electronic equipment and their components or consumables or parts or spares; or (iv) imports used electrical and electronic equipment; irrespective of the selling technique used such as dealer, retailer, e-retailer, etc.
	Bulk consumer	Any entity which has used at least one thousand units of EEE listed in Schedule 1, at any point of time in the particular financial years, including via online retail.
	Dismantler	Any person or entity engaged in dismantling of used EEE into their components and having authorisation from concerned State Pollution Control Board or Pollution Control Committee as per the guidelines of the Central Pollution Control Board.
	E-retailer	An individual or company or business entity that uses an electronic network such as internet, social media, telephone or any other media, to sell its goods.

Country	Stakeholder	Definition
Republic of India	**Manufacturer**	A person or an entity or a company as defined in the Companies Act, 2013 (18 of 2013) or a factory as defined in the Factories Act, 1948 (63 of 1948) or Small and Medium Enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006), which has facilities for manufacture of electrical and electronic equipment as specified in Schedule-I.
	Recycler	Any person or entity who is engaged in recycling and reprocessing of waste electrical and electronic equipment or assemblies or their components or their parts for recovery of precious, semi-precious metals including rare earth elements and other useful recoverable materials to strengthen the secondary sourced materials and having facilities as elaborated in the guidelines of the Central Pollution Control Board made in this regard.
	Refurbisher	Any person or entity repairing or assembling used electrical and electronic equipment as listed in Schedule-I for extending its working life over its originally intended life and for same use as originally intended, and selling the same in the market.
European Union	**Producer**	Any natural or legal person who, irrespective of the selling technique used, including by means of distance communication in accordance with Directive 97/7/EC(e) of the European Parliament and of the Council of 20 May 1997 on the protection of consumers in respect of distance contracts- (i) is established in a Member State and manufactures EEE under his own name or trademark, or has EEE designed or manufactured and markets it under his own name or trademark within the territory of that Member State; (ii)is established in a Member State and resells within the territory of that member State, under his own name or trademark, equipment produced by other suppliers, a reseller not being regarded as the ''producer'' if the brand of the producer appears on the equipment, as provided for in sub-paragraph (i); (iii) is established in a Member State and places on the market of that Member State, on a professional basis, EEE from a third country or from another Member State; or (iv) sells EEE by means of distance communication directly to private households or to users other than private households in a Member State, and is established in another Member State or in a third country.
	Distributor	Any natural or legal person in the supply chain, who makes an EEE available on the market. This definition does not prevent a distributor from being, at the same time, a producer.
Japan	**Producer (according to the Act on the Promotion of Effective Utilization of Resources)**	A person who operates a business at a factory or workplace (including those pertaining to Construction Works; the same applies hereinafter) and a person who operates a business of selling products (these persons will be referred to as ''Business Operators'' hereinafter) or a client of a Construction Work.
	Producer (according to the Act on Promotion of Recycling of Small E-waste)	Businesses generating small e-waste in association with their business activities; retailers of small e-waste in the course of trade and manufacturers of small e-waste in the course of trade.

Annex 3. Sample obligations for EEE producers

Types of responsibilities	Sample obligations
Operational	• Join a PRO and license products with the PRO • Organize or participate in take-back systems for used products • Ensure proper collection, transport and treatment of end-of-life products • Label products with disposal or recycling instructions • Provide reverse logistics for product returns or recycling
Financial	• Pay EEE-EPR fees to cover the costs of collection, sorting, recycling and disposal of end-of-life products • Fund public awareness campaigns and consumer education • Support infrastructure development • Contribute to end-market development for recycled materials
Administrative	• Register with regulatory authorities and/or PRO(s) • Submit regular reports on product volumes placed on the market and waste managed, packaging, quantities, carbon footprint, minimum content of recycled materials and others • Maintain records of compliance and performance metrics • Undergo audits and inspections to ensure adherence to EEE-EPR obligations
Product design and environmental performance	• Design products for recyclability and reduced environmental impact • Use recycled content in new products • Reduce hazardous substances in product composition • Promote reuse and repairability of products • Meet take-back and elimination requirements • Actively engage in sustainable practices
Consumer engagement and transparency	• Inform consumers about bring-back options and recycling instructions • Provide transparency on how products are managed at their end-of-life • Participate in public education and awareness-raising campaigns on sustainable consumption

Annex 4. Sample content of an EEE-EPR regulation on e-waste (will continue on next pages)

Every system is different, economically, culturally and geographically. The below is a mock-up of the provisions that can be integrated into regulation.

GENERAL PROVISIONS	
Content	**Brief description**
Subject matter	Defines the overall objective and purpose of the regulations.
Application scope	Specifies the application scope covered by the regulations and the entities to which the regulations apply.
General principles	Outlines the guiding principles for e-waste management, such as the precautionary principle, circular economy, polluter pays principle, sustainable development and/or extended producer responsibility.
Definitions	Provides clear definitions for key terms and principles used throughout the regulations, such as "electrical and electronic equipment", "e-waste", "producer", "extended producer responsibility".
PRODUCERS OF ELECTRICAL AND ELECTRONIC EQUIPMENT (EEE) AND EXTENDED PRODUCER RESPONSIBILITY (EPR)	
Content	**Brief description**
Producer definition	Defines which entities qualify as EEE producers under the regulations.
Extended Producer Responsibility	Enforces the EPR principle, which holds producers accountable for the entire lifecycle of their products, including take-back, recycling and disposal.
Application of Extended Producer Responsibility	Details how EEE-EPR is to be implemented.
Type(s) of Extended Producer Responsibility	Specifies the selected type of EEE-EPR scheme, such as individual, collective or hybrid EEE-EPR system.

CLASSIFICATION OF ELECTRICAL AND ELECTRONIC EQUIPMENT	
Content	**Brief description**
Classification of Electrical and Electronic Equipment	Categorizes different types of EEE (usually refers to a detailed annex) listing the classification of EEE.
Calculation of EEE quantities generated	If applicable: This outlines methods for calculating the quantities of EEE placed on the market.
Collection and recycling data	If applicable: This specifies the data that must be collected on the collection and recycling of e-waste and methodology for calculation.
Data calculation	If applicable: This details the methodologies for calculating and reporting data on e-waste generation, collection, and recycling.
OBLIGATIONS AND RESPONSIBILITIES	
Content	**Brief description**
Obligations and responsibilities of government bodies	Describes the responsibilities of government agencies in regulating and overseeing e-waste management.
Obligations and responsibilities of EEE producers	Outlines the specific duties of EEE producers under the EEE-EPR framework, including take-back, recycling, and reporting.
Obligations and responsibilities of other stakeholders (This includes distributors, resellers, waste managers and operators, consumers, civil society.)	Defines the roles of other stakeholders, such as distributors, resellers, waste managers, operators, consumers, and civil society, in e-waste management.
ORGANIZATION OF E-WASTE MANAGEMENT SYSTEM	
Content	**Brief description**
Oversight	Establishes processes for system guidance and oversight.
Individual and collective EPR systems	Describes the organization and operation of the selected EPR scheme for e-waste management.
EPR management plans	If applicable: This outlines the requirements for producers to develop and implement EEE-EPR management plans.

DISPOSITIONS ON FINANCIAL AND INFORMATION FLOWS	
Content	**Brief description**
E-waste management system financing	Details the financial mechanisms for supporting the e-waste management system, including fees, levies, and funding sources.
Information management under e-waste management system	Specifies the requirements for managing and reporting information related to e-waste management.
CAPACITY-BUILDING AND AWARENESS-RAISING DISPOSITIONS	
Content	**Brief description**
Education	Outlines initiatives for educating stakeholders and the public about e-waste management.
Awareness raising	Describes campaigns and activities to raise awareness about the importance of proper e-waste management.
Incentives	Specifies incentives for stakeholders to participate in and comply with e-waste management regulations.
COMPLIANCE AND MONITORING	
Content	**Brief description**
Competent authorities	Defines the authorities responsible for enforcing e-waste management regulations.
Compliance	Describes the measures and procedures for ensuring compliance with the regulations.
System monitoring	Outlines the methods for monitoring the performance and effectiveness of the e-waste management system.
Penalties and sanctions	Specifies the penalties and sanctions for non-compliance with the regulations.

FINAL PROVISIONS	
Content	**Brief description**
Import and export of Electrical and Electronic Equipment	If applicable: This regulates the import and export of EEE to ensure compliance with e-waste management standards.
Import and export of used Electrical and Electronic Equipment	If applicable: This specifies the requirements for the import and export of used EEE to prevent illegal dumping and ensure proper management.
Informal sector integration	If applicable: This describes measures to integrate the informal sector into the formal e-waste management system.
Transition period	Outlines the transition period for compliance with the regulations.
Related or derived regulatory instruments	If applicable: This lists other related or derived regulatory instruments related to e-waste management.
Derogation	If applicable: This provides for exceptions or derogations from certain provisions of the regulations.
Entry into force	Specifies the conditions/date for entry into effect of the regulations.
ANNEXES	
Content	**Brief description**
Electrical and Electronic Equipment classification	Provides a detailed classification of different types of EEE.
Electrical and Electronic Equipment data calculation methodology	If applicable: This outlines the methodology for calculating data related to EEE.
E-waste generation data calculation methodology	If applicable: This outlines the methodology for calculating e-waste generation data.
Registration forms	If applicable: This includes forms for registration such as EEE-EPR registration.
Reporting forms	If applicable: This provides forms for reporting data related to e-waste management.
EPR management plan	If applicable: This provides content outline and/or format requirements for EPR management plans.

Annex 5. EPR fee determination (will continue on next pages)

Every system is different, economically, culturally and geographically. The below is a mock-up of the provisions that can be integrated into regulation.

EPR fee types	Steps for EPR fee determination
Flat fee (most common) In a flat/ base EPR fee structure, a fixed rate is applied to a product category. The flat/base fee structure offers a simple and predictable method for gathering funds for PROs. This means that producers will paying a fee based on their market share. The costs associated with the management of e-waste are made up of the sum of costs of activities related to operational management, as well as other necessary activities, such as administrative and enforcement aspects. Therefore, the activities can be split between operational or technical costs and overhead or framework costs.	**Step 1:** Identify the product categories within the EPR scope **Step 2:** Select the relevant codes that describe product categories in the Harmonized Commodity Description and Coding System (HS) **Step 3:** Estimate the waste arising and collected (expressed in tonnes), either as: • a proportion of the products put on the market (or) • a proportion of the e-waste generated. >> Data on EEE Put on Market (PoM) can come from several data sources including customs department or national statistics registry. When a country has no data available on Put on Market of electric and electronic equipment, you can instead make estimates of the weight of PoM in the year concerned using the “apparent consumption method”. The PoM equals the sum of domestic production and imports of EEE in the year minus the EEE exported in the same year. E-waste generation is generally calculated using the sales data and the lifespan distributions. >> Other possible data sources are registers from waste companies, reports from NGOs, or other environmental surveys in the country. A number of public and industrial associations at the national level compile statistics for their own use on the management of e-waste streams. Sectoral data of this kind may be used by countries in their national statistics on e-waste treatment. Where such data are used, it is advisable to take steps to ensure that they meet the requirements and quality criteria defined by national e-waste legislations. Scientific literature may also be an interesting source for statistics on the collection and recycling of e-waste, as research in this field is making significant progress worldwide.

EPR fee types	Steps for EPR fee determination
	Step 4: Calculate the total annual costs per product category. • Operational cost (cost/tonne) = costs associated with (access to e-waste + collection + transportation + treatment) >> There are various methods for determining the various operational costs, which could include an independent evaluation and also negotiations, as well as discussions with stakeholders. • Overhead cost (cost/tonne) = costs associated with (enforcement + audits + awareness + financial guarantees + R&D) **Note:** The splitting of overhead costs per category can be done according to the mass of products put on the market (% market share) or the proportion of e-waste collected. Operational costs, on the other hand, are multiplied by the tonnes of product collected for that specific e-waste stream.
	Step 5: Allocate the total annual costs to producers through a product fee formula.
	Step 6: Decide on the revision timeframe. It is important to regularly review the steps above to ensure enough funds are collected and fees are calculated with precision.
Variable fee A variable fee based on the actual amount of E-waste processed per producer, often adjusted retrospectively. The fee is adjusted for actual collection and recycling rates and may consider other factors, such as market share.	There is no one size fits all formula to determine a variable fee. A hybrid approach is recommended.
	The flat fee approach described above could be considered as a first step for determining the variable fee.
	Variables that may be taken into account: • Bi-yearly/yearly/monthly collection and recycling rate per producer • Market share of producer (usually calculated per category of regulated product or per sector) • Percentage of recycled materials in EEE put on the market by each producer (this is only feasible in a mature EEE sector) • Recyclability rating of the EEE put on the market by each producer (this is only feasible in a mature EEE sector).
	The maturity of the sector is the main controlling factor that will determine a variable EPR fee. In a mature sector, companies can focus on everything from product design, percentage of recycled content, ease of repairs and recycling to collection, transportation, and storage and not only on recycling. A fledgling sector may primarily focus on collection. Therefore, an approach for a mature sector will differ from an approach suitable for a sector that has not yet developed and implemented an EPR system.

Annex 6. Sample workplan for establishing a PRO (will continue on next page)

Annex inspired by dss+

The following table provides some general high-level, but actionable, steps to support the establishment of a PRO. These steps are grouped under several key workstreams that are to be developed in parallel. They include governance frameworks, engagement and onboarding of members, operational frameworks and tools, data gathering, engagement with the regulator and PRO operational launch.

Governance framework	
Task	**Associated outcomes**
Convene a core task force of stakeholders driving the PRO start-up effort	List of stakeholders constituting the core task force and mandate to take first decisions
Name the PRO for identity, communication and registration	PRO name decided by core task force
Carry out administrative and legal discussion on the legal form for the PRO	Agreement on the legal form of establishment of the PRO
Generate draft governance for the PRO	Main principles and structure/outline of contents agreed upon by the task force
Review the governance framework with members and relevant stakeholders	List of concerns and amended operations with agreement/consensus on governance framework and principles
Draft final documentation outlining the PRO governance	Statutes and other relevant documents
Decide on a plan to establish the first official body of the PRO with timeline for functioning	Action plan agreed upon by the committee on how and when the first official body will be established

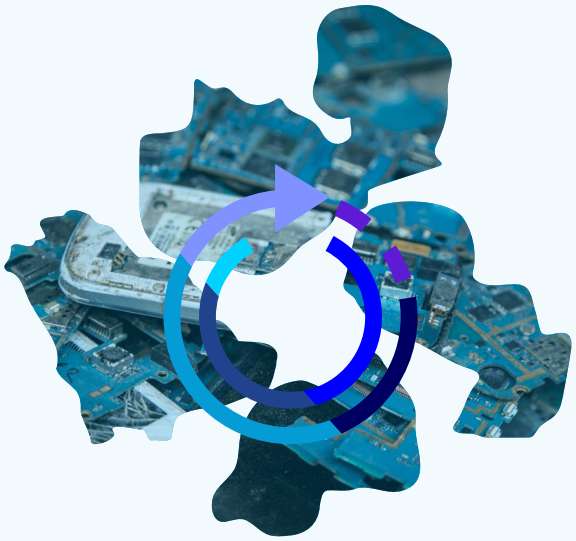
Engagement and onboarding of members	
Task	**Associated outcomes**
Identify EEE producers in the country	Full list of EEE producers for the purposes of PRO engagement
Establish initial engagement approach and lead initial engagements	Onboard members with awareness of regulation and engagement strategy
Establish continued engagement approach designed to onboard new members, maintain engagement of old members and consult members on key topics	Engagement approach summary

Operational frameworks and tools	
Task	**Associated outcomes**
Decide on the organization of the PRO for budgeting and planning purposes	Decision of the core task force on the organization of the PRO for budgeting and planning
Work on member fee model	Decision of the core task force on the model for the PRO member fee
Create an operational budgeting tool for the PRO	Operational tool to manage the basic waste operations or budget of the PRO
Refine PRO budget estimate, using the data collected under a data workstream, and the operations tool created under this operational workstream	Final budget ranges
Draft and approve principles of general operations for the PRO, taking into account member inputs	One document approved by decision-making body
Engage PRO members to gather their opinions and concerns on operational framework and tools	List of concerns and suggestions for amended operational framework and tools
Re-confirm proposed fee amounts	Proposed fees
Discuss and agree/approve the high-level fee structuring for the PRO	Final fees
Engage PRO members in consultations on main operational principles and frameworks to enable companies to understand and then adapt internally on the agreed upon operations	Action steps for each company to adapt internally on the agreed upon operations
Approve initial budget, fees, operational frameworks and tools on PRO level	Official approval, as per the PRO governance

Data gathering	
Task	**Associated outcomes**
If applicable research potential PRO collection targets	Draft of proposed collection targets, with justifications
If applicable validate/adopt collection targets with the relevant stakeholders	Final proposed targets
Decide/approve approach for gathering data from recyclers	Approach to consult recyclers, approved by the committee
Research all current recyclers' prices	Tentative indications of price ranges

Engagement with the regulator	
Task	**Associated outcomes**
Check requirements from regulator/regulation on how to officially register the PRO/ensure its official recognition by the regulator	Clarity on requirements and steps
Consult the necessary legal and administrative procedures for registering the PRO under the regulator	Registration as a PRO
Establish a regulator communication channel with the regulator on the topic of the PRO	Engagement approach summary

PRO operational launch	
Task	**Associated outcomes**
Define core human resource (HR) responsibilities, recruit and hire PRO personnel	PRO initial personnel hired
Contract service providers for the PRO	First service providers found and onboarded



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