Digital Cooperation Organization

DCO E-Waste Management Framework

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Digital Cooperation Organization

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0. Context of the Framework

Digital Cooperation Organization

The Digital Cooperation Organization (DCO) Is A Multilateral Inter-governmental Organization Dedicated To Accelerating The Inclusive And Sustainable Growth Of The Digital Economy.

Overview: The Digital Cooperation Organization

Non-Exhaustive

- **The DCO seeks to establish the optimal infrastructure and policies** for the creation of inclusive and equitable digital economies where all people, businesses, and governments can innovate and thrive.
- In pursuit of the Member States' common interests, **the DCO works collaboratively with digital economy stakeholders, including governments, the private sector, international organizations, NGOs, and civil society.**

The DCO Unites Ministries of Communications and Information Technology of 16 Member States:

Bahrain	Bangladesh	Cyprus	Djibouti
The Gambia	Ghana	Greece	Jordan
Kuwait	Morocco	Nigeria	Oman
Pakistan	Qatar	Rwanda	Saudi Arabia

VISION

A world where every country, business, and individual has the opportunity to thrive in a sustainable digital economy.

MISSION

Achieving social prosperity and growth of the digital economy by unifying efforts to advance digital transformation and promote common interests.

www.dco.org

DCO'S STRATEGIC GOALS TO ACHIEVE BY 2030

1. **Empower businesses** of the DCO cross-border digital market **to thrive in the global digital economy.**
2. **Leverage the full potential of data** across the DCO ecosystem.
3. Foster an **inclusive, human-focused, and sustainable** Digital Economy.

Focus of this initiative

Source: DCO

In 2024, The DCO Launched The E-Waste Management Program To Address Sustainability Challenges Of The ICT Sector And Promote The Sustainable Growth Of The Digital Economy.

Directional

AMBITION

Create a **framework for E-Waste Management**, derived from the Circular Economy aspect of the ICT Sustainability Framework, aimed at offering practical guidance for the **setup, execution, and enhancement** of e-waste management at both the **national and international (cross-border) levels.**

OBJECTIVES

Sustainability through E-Waste Reduction

- EMP promotes responsible e-waste management practices, supporting UN Sustainable Development Goals, including climate action.

Harnessing E-Waste's Economic Value

- In 2019, global e-waste contained USD 57 billion in raw material value
- Better e-waste management recovers valuable materials for manufacturing.

Promoting Digital Inclusion

- Redeploying 1% of the 5 Bn smartphones discarded in 2022 could provide 50 Mn people in DCO Member States with affordable devices, bridging the digital divide.

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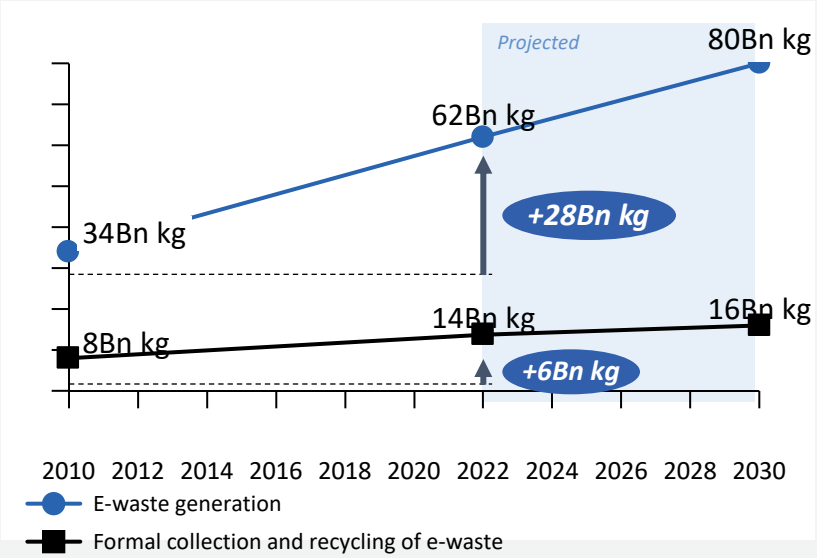
E-Waste Is A Growing Issue: Insufficient And Ineffective Collection And Recycling Systems Can Result In Non-compliant E-Waste Management.

E-Waste Growth and Environmental Impact

Non-Exhaustive

VOLUMES OF GLOBAL E-WASTE GENERATION, COLLECTION AND RECYCLING [2010-2030]



E-Waste generation has **grown by an average of 2.3 billion kilograms** since 2010.

E-Waste **generation** is growing **five times faster** than formal **recycling**.

Poor e-waste management causes **harmful emissions**, posing **health and environmental risks.**

E-Waste contains hazardous materials, including toxic metals, flame retardants, and persistent organic pollutants.

45Mn kg
of plastics containing brominated flame retardants incorrectly managed.

58k kg
of mercury released yearly.

145Bn kg
of **CO2-equivalent emissions** from **mismanagement of refrigerants** released yearly.

Over 11 million informal workers in developing countries **face serious health risks** from handling hazardous e-waste materials.

Source: Global E-Waste Monitor 2024, Global Transboundary E-Waste Flows Monitor 2022

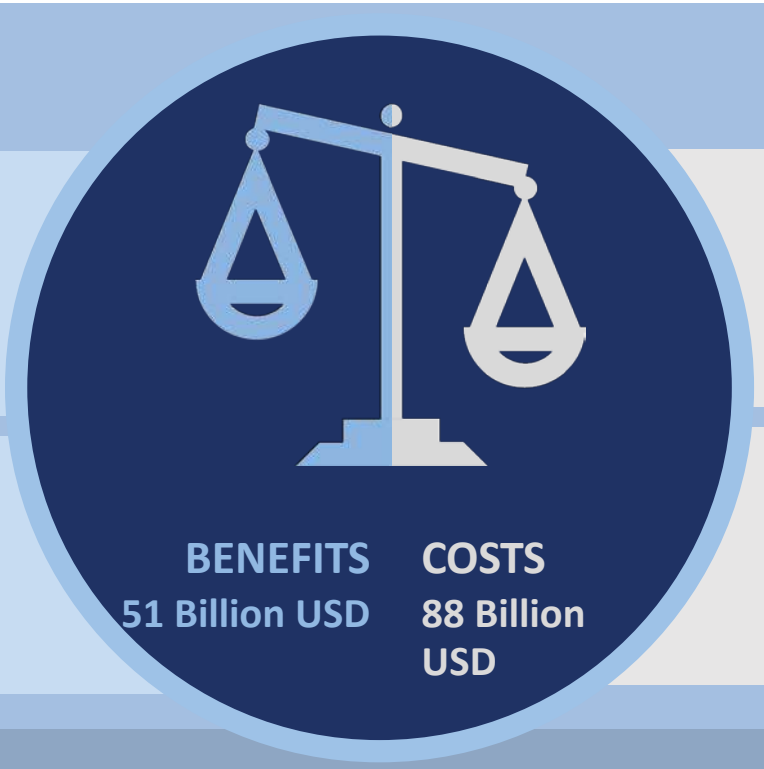
At the Current Recycling rate of Approximately 20%, Global Societal Costs Outweigh Benefits by $37 Billion, Leaving Significant Value Untapped.

Estimated Economic Impact of the Current E-Waste Management System

Directional

USD 28Bn
Worth of **recovered metals brought back** into the circular economy.

USD23Bn
Monetized value of **avoided greenhouse gas** emissions.



-37Bn USD cost overall

USD 78Bn
Externalized costs to the population and the environment.

USD 10Bn
Associated with the **cost of e-waste treatment.**

- **Overall economic impact is projected to rise to USD 40 billion in costs by 2030,** if global e-waste management systems maintain their current trajectory.
- However, if a 60% recycling rate is achieved globally by 2030, there is **potential for up to USD 38 billion in net benefits.**

Source: Global E-Waste Monitor 2024, Global Transboundary E-Waste Flows Monitor 2022

DCO Member States Face Multiple Challenges In E-Waste Management, Including Limited Infrastructure, Data, And Law Enforcement

Common Challenges in E-Waste Management

Non-Exhaustive

COMMON CHALLENGES

- **Lack of e-waste specific legislation** and/or challenges with **enforcement.**
- Low **Consumer Awareness.**
- **Limited e-waste** collection, treatment and recycling **infrastructure.**
- **Fragmented Value Chain,** with unregulated **informal sector involvement.**
- **Limited** availability of e-waste **data,** and lack of e-waste **tracking system.**
- **Limited adoption of Extended Producer Responsibility.**
- **Illegal import** of e-waste.
- **Commercial viability** of operating high quality **recycling infrastructure.**

Countries must strengthen e-waste management systems by diagnosing the current situation and empowering private and social sectors.

Source: DCO, Expert interviews, Survey to the DCO Member States

…And Also Have Several Opportunities To Be Leveraged, Including Collaboration, Private Sector Incentivization, And Strengthening Of E-Waste Legislation.

Common Opportunities in E-Waste Management

Non-Exhaustive

COMMON OPPORTUNITIES

- **Strengthen the regulatory framework for e-waste** based on best practices and improve enforcement.
- Initiate initiatives to **raise public awareness about e-waste management.**
- **Reuse electronics** to help bridge the digital divide.
- Foster international collaborations to **address knowledge gaps** in e-waste management and promote effective and sustainable solutions.
- **Collect data to monitor and improve** the e-waste system.
- Embed **e-waste-specific Extended Producer Responsibility** (EPR) in legislation.
- **Leverage the DCO to expand international collaboration and regulate e-waste import/export.**
- **Design incentives** and **Public-Private Partnerships (PPPs)** to promote formal economy.

There is no one-size-fits-all solution: Each country should define its own roadmap to leverage these opportunities, improve e-waste management, and amplify social, economic, and environmental impact.

Source: DCO, Expert interviews, Survey to the DCO Member States

The Program Includes Analyzing Best Practices, Developing An E-Waste Management Framework, And explore the testing of The Framework With The DCO Member States.

Non-Exhaustive

SCOPE

Document best practices in e-waste management and analyze how DCO Member States align with these standards.

Develop a framework for e-waste management that the DCO Member States can leverage to activate impact on a local level.

Explore with Member States practical collaboration on e-waste.

This Document

- **This Document Outlines The DCO's E-Waste Management Framework, Including Benchmarking Of Existing Frameworks, As Well As The Design And Testing Of a Tailored Framework**

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We Followed A Four-step Approach To Define A New E-Waste Management Framework, Ensuring It Aligned With The DCO's Objectives

Process for E-Waste Management Framework Development

Illustrative

1

Define The Fundamentals Of The E-Waste Management Framework.

2

Benchmark Best Practices And Existing Frameworks.

3

Design The E-Waste Management Framework.

4

Refine The Framework Using Global Roundtables And A Review With DCO Member States.

1. E-Waste Management Framework Overview

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In The First Step, We Defined The Fundamentals Of The E-Waste Management Framework, Looking At The Key Objectives, Ambition, Target Audience, Scope, And Design Principles.

Process for E-Waste Management Framework Development

Illustrative

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The DCO Aims To Design An E-Waste Management Framework To Enable Governments To Activate All The Stakeholders And Take Actions At National And Cross-border Levels Based On Best Practices.

Directional

E-Waste Management Framework Fundamentals

Ambition

- Enable countries **worldwide to enhance their e-waste management systems** to **(1)** promote **sustainability in the ICT sector, (2)** address the **digital divide**, and **(3)** capitalize on the **economic potential** of material recovery from e-waste.

Objectives

- **Define a comprehensive E-Waste Management Framework**, including key components to facilitate effective management at both national and international levels.
- Guide governments to improve e-waste management systems **through key success factors and mechanisms based on best practices.**

Audience

- **Government agencies,** including ministries, regulators and municipalities.

The framework is designed to assist the governments of all countries, and is not limited to DCO Member States

The Scope Definition Ensures that The Framework Is Simple, But Not Simplistic: It Is Applicable to Governments Across The Globe, Looking At The Whole Value Chain, Including Import And Export.

E-Waste Management Framework Scope

Non-Exhaustive

The Framework IS:

A structured summary of key best practices that countries should consider.

Country agnostic, and applicable to countries with e-waste management systems at all levels of maturity.

Targeting governments, highlighting what they can do to strengthen and scale e-waste management efforts.

Looking both at the national and cross-border e-waste management best practices.

The Framework IS NOT:

A step-by-step toolkit highlighting the implementation processes for best practices.

Tailored to DCO Member States, most of whom are in the initial stage of e-waste management system.

Applicable to the private and social sector, to integrate them into national e-waste management systems.

Focused only on e-waste cross-border flows, to support bilateral agreements.

We Determined Five Key Design Principles Which Should Guide The E-Waste Management Framework Development To Ensure That It Meets Its Ambition And Objectives.

Design Principles for the E-Waste Management Framework

Directional

Covers The Whole E-Waste Value Chain

Covers all stages of the value chain, from e-waste generation to landfill.

Considers Both National And Cross-border E-Waste Flows

Focuses on both the national e-waste management systems, and e-waste cross border collaboration.

Exhaustive Coverage Of Government-Driven Mechanisms

Focuses on both national e-waste management systems and cross-border e-waste collaboration.

Country Agnostic: Applicable To Diverse Contexts

Relevant for countries across different regions with varying levels of e-waste management maturity.

Simple, Practical, And Effective

Focuses on practical insights and clear guidance for adopting best practices.

In The Second Step, Key Components And Mechanisms For Successful E-Waste Management Were Identified By Benchmarking Best Practices And Frameworks.

Process for E-Waste Management Framework Development

Illustrative

1

Define The Fundamentals Of The E-Waste Management Framework.

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Benchmark Best Practices And Existing Frameworks.

3

Design The E-Waste Management Framework.

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Refine The Framework Using Global Roundtables And A Review With DCO Member States.

We Reviewed Over 13 Frameworks With A Dedicated Focus On E-Waste Management And A Broader View Of Waste Management And Circularity.

analyzes of Existing Frameworks

Non-Exhaustive

1 E-WASTE MANAGEMENT FRAMEWORKS

8 Frameworks Analyzed

Sources

Ministry of Foreign Affairs of Denmark · unitar · World Economic Forum · ITU · adelphi · China Academy of Engineering

Characteristics identified across frameworks:

- **Value chain overview:** Identifies stages in the e-waste value chain.
- **Mechanisms for governments:** Identifies focus areas to enable change.
- **Policy instruments focus:** Identifies instruments to operationalize policy.

Key takeaways

- Combining **2+ characteristics** (e.g., focused on implementation and/or prevention of the issue, not focused on policies and government mechanisms, etc.) can provide structure and depth.
- Frameworks emphasize **implementation** steps as the required processes, planning, maintenance, and monitoring of impact.

2 WASTE/CIRCULARITY FRAMEWORKS

5 Frameworks Analyzed

Sources

UN environment programme · Alliance to End Plastic Waste · Curtin University · TU Delft · Universiteit Utrecht · ASU Arizona State University

Characteristics identified across frameworks :

- **Stages of maturity:** Defines specific priorities for countries at different stages of maturity in the waste management.
- **Action-based:** Identifies specific actions that stakeholders need to take to build desired systems, based on the framework's scope and aim.

Key takeaways

- Issues and actions can be categorized according to **mechanisms** or life cycle/value chain phases.
- Some considerations and actions are applicable **across the value chain**, while others are stage-specific.

Eight E-Waste-Specific Frameworks Were Analyzed, And While None Fulfilled The DCO's Objectives, They Provided Informative Takeaways To Guide The Design Of A New Framework.

Summary: E-Waste Specific Frameworks

Non-Exhaustive

1 E-WASTE MANAGEMENT FRAMEWORKS

- Stocks and Flows of E-Waste
- Toolkit for Policy Practices in E-Waste Management
- Global Transboundary E-Waste Flows
- Life Cycle Framework for E-Waste Management
- Policy and regulation frameworks on waste and EPR
- Model Framework for E-Waste Management in East Africa
- Stages in the management of ICT/UEEE and ICT/e-waste
- Model policy framework for the management of ICT/e-waste

Design Principles

Many of the frameworks are country agnostic and include the whole value chain, but few are simple and practical or cover exhaustive government levers

5/8 4/8 3/8 5/8 1/8

Target Audience

Public Sector

Public and Social Sector

Geography

3 Global 1 EU
3 Africa 1 China

2 WASTE/CIRCULARITY FRAMEWORKS

KEY TAKEAWAYS

1. The existing frameworks do not completely fulfill the DCO ambitions, objectives, and aim (see slide 15-16) and the guiding principles (slide 17)→ **Design a tailored new framework**
2. Frameworks with more than one dimension provide great structure and insights for the audience → **Combine 2+ elements** (e.g. value chain and instruments)
3. Many frameworks focus already on planning, maintenance and monitoring → **Don't focus on the implementation approach**, as this is already covered extensively

The Five Waste And Circularity Frameworks Analyzed Are More Diverse, With Some Being Simple And Focused On Waste Hierarchy, While Others Are More Complex And Articulated Across Dimensions.

Summary: Waste and Circularity Frameworks

Non-Exhaustive

1 E-WASTE MANAGEMENT FRAMEWORKS

2 WASTE/CIRCULARITY FRAMEWORKS

- Waste Hierarchy
- Strategic Framework for the Circular Economy.
- Strategic Framework for Working Toward Zero Waste Societies.
- Waste and Climate Change: Strategy Framework
- Plastic Waste Management Framework

Design Principles

Most of the frameworks are practical and government-focused, but do not consider national or cross border e-waste flows.

0/5 0/5 3/5 4/5 4/5

Target Audience

- Public Sector
- Public and Social Sector

Geography

4 Global
1 EU

KEY TAKEAWAYS

1. **Frameworks categorize actions** (e.g., by value chain stage or mechanism type) to enable countries to step up efforts on general e-waste → **Elaborate action-oriented content.**
2. Most frameworks focus specifically on levers that can be **enforced at a government level** and are not e-waste specific → **Target government audiences as most effective in driving changes.**
3. **Frameworks are very different** in terms of complexity and approaches → **Keep it simple.**

None Of The Frameworks Met All The DCO's Objectives; However, Several Contained Elements That Were Useful In Informing The Approach And Components Of A New Framework.

Compatibility of Frameworks with Design Principles

Illustrative

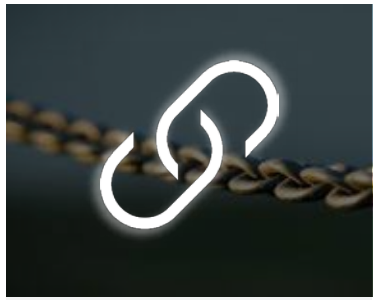
		Covers The Whole E-Waste Value Chain	Considers Both National And Cross-border E-Waste Flows	Exhaustive coverage of Government-Driven mechanisms	Country Agnostic: Applicable To Diverse Contexts	Simple, Practical, And Effective
E-Waste specific	Stocks And Flows Of E-waste	✓	✓	✗	✓	✗
	Toolkit For Policy Practices In E-Waste Management	✓	✓	✗	✗	✓
	Global Transboundary E-Waste Flows	✗	✓	✗	✓	✗
	Life Cycle Framework For E-Waste Management	✓	✗	✓	✗	✗
	Policy And Regulation Frameworks On Waste And EPR	✗	✗	✗	✗	✗
	Model Framework For E-waste Management In East Africa	✗	✓	✓	✗	✗
	Stages In The Management Of ICT/UEEE And ICT/E-Waste	✓	✗	✗	✓	✗
	Model Policy Framework For The Management Of ICT/E-Waste	✓	✓	✓	✓	✗
Waste/circularity	Waste Hierarchy	✗	✗	✗	✓	✗
	Strategic Framework For The Circular Economy	✗	✗	✓	✓	✓
	Waste And Climate Change: Strategy Framework	✗	✗	✓	✓	✓
	Strategic Framework For Working Toward Zero Waste Societies	✗	✗	✗	✗	✓
	Plastic Waste Management Framework.	✗	✗	✓	✓	✓

To Effectively Design The New DCO "E-Cycle In Action For Governments" Framework, We Must Consider Five Guiding Principles For The Content Development And The Overall Framework's Approach.

Non-Exhaustive

Differentiating Factors

Content covered | **Approach/Methodology**



Covers The Whole E-Waste Value Chain

Will provide comprehensive coverage of all stages of the value chain, from e-waste generation to landfill.

Considers Both National And Cross-border E-Waste Flows

Will focus on both national e-waste management systems and e-waste cross border collaboration.

Exhaustive Coverage Of Government-Driven Mechanisms

Will cover all types of interventions that can be instated by governments at a national and international level.

Country Agnostic: Applicable To Diverse Contexts

Will be relevant for countries across different regions, and with different levels of e-waste management maturity.

Simple, Practical, And Effective

Will prioritize actionable insights, clear guidance, and simplicity to guide selection of best practices to adopt.

The New E-Waste Management Framework Will Be Unique In The Breadth Of Its Coverage Of Government Interventions, Beyond Focusing Only On Policies Across The Value Chain.

Differentiating Factors

Non-Exhaustive

Maps government mechanisms exhaustively **across the entire e-waste value chain.**

Brings together **national and cross-border e-waste considerations** in an integrated framework.

Looks beyond policies to provide **comprehensive coverage of government-driven mechanisms**, including regulations, financing, capability building, and digital tools, through stakeholder engagement and private sector enablement.

In The Third Step, The E-Waste Management Framework Was Designed Based On Insights From Existing Frameworks, Benchmarking, And Current-State Assessments Conducted.

Process for E-Waste Management Framework Development

Illustrative

1

Define The Fundamentals Of The E-Waste Management Framework.

2

Benchmark Best Practices And Existing Frameworks.

3

Design The E-Waste Management Framework.

4

Refine The Framework Using Global Roundtables And A Review With DCO Member States.

We Took The Guiding Principles And Desired Characteristics, Including Differentiating Factors, To Design The Main Elements Of The Framework.

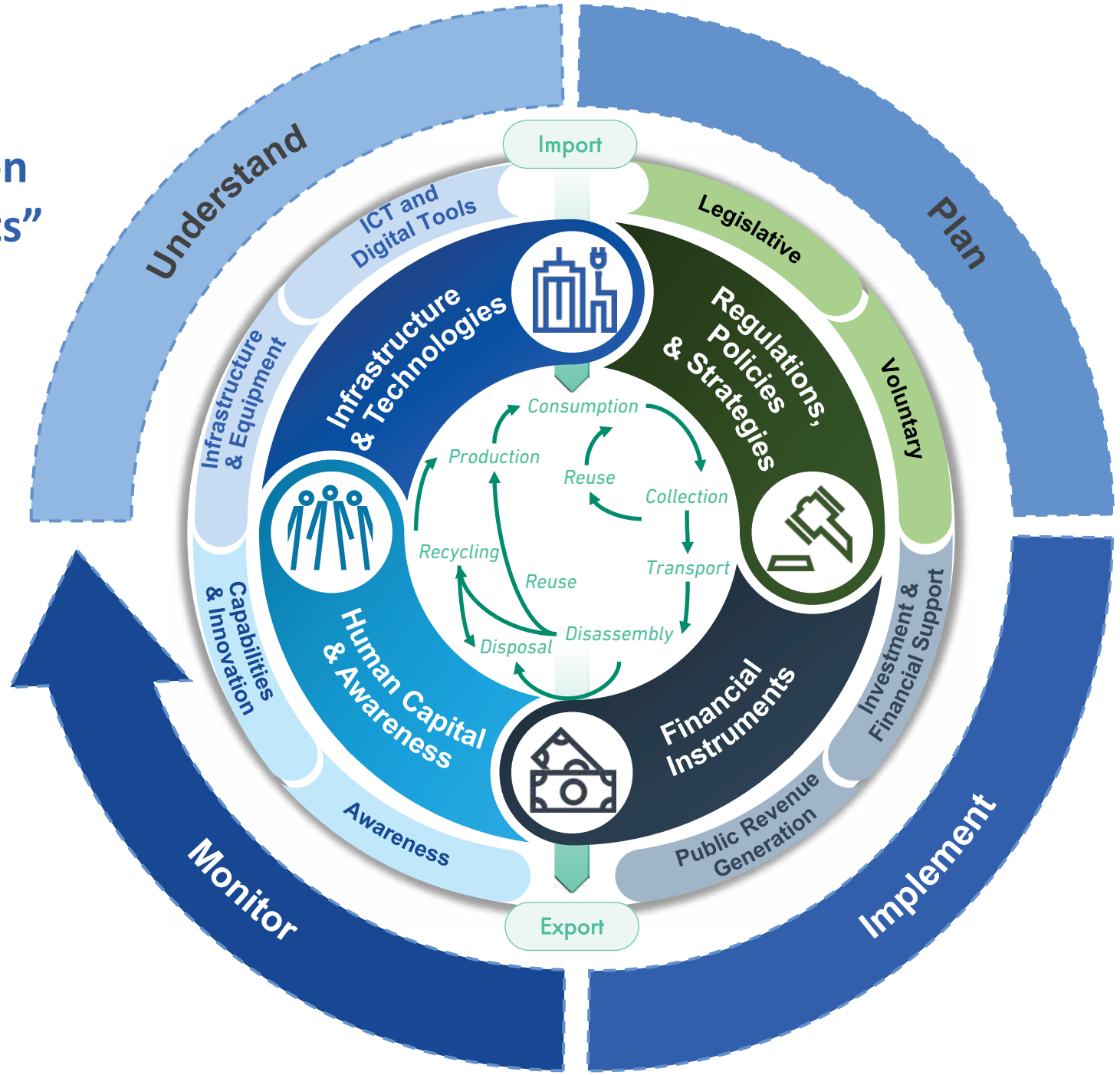
Development of Framework Components

Non-Exhaustive

Differentiating factor

Guiding Principles	Desired characteristics	Framework Layers
Covers The Whole E-waste Value Chain	• Maps government mechanisms exhaustively **across the whole value chain.**	**1** The first Layer of the framework structure is the **value chain, including import and export steps.**
Considers Both National And Cross-border E-Waste Flows	• Brings together **national and cross-border considerations** in an integrated framework.	
Exhaustive Coverage Of Government-Driven Mechanisms	• Looks beyond policies to provide **comprehensive coverage of government-driven mechanisms**, including capability building and private sector enablement.	**2** The second Layer of the framework is **categories of government-driven mechanisms.**
Country Agnostic: Applicable To Diverse Contexts	• Derives content **from best practices** and encourages **countries to identify relevant mechanisms** for implementation **based on their current state.**	**3** Alongside the framework, **stages for successful implementation** is detailed.
Simple, Practical, And Effective	• **Clearly structured**, including no more than two dimensions to ensure comprehensibility, and provides specific **guidance for actioning the framework.**	

“E-Cycle In Action For Governments”



The E-Waste Value Chain Component Was Guided By The Benchmarked Frameworks, Adapted To Create A Clear And Comprehensive Value Chain, Which Includes Imports And Exports.

Framework Component Development: Value Chain Component

Illustrative

Guided by existing frameworks…

- Life Cycle Framework for E-Waste Management

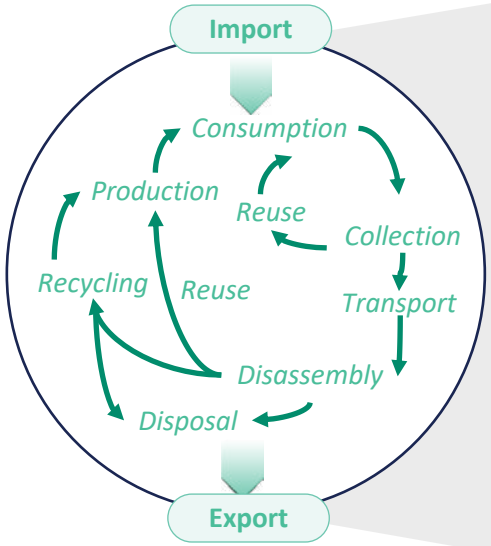
- Stages in the management of ICT/UEEE and ICT/e-waste

- Strategic Framework for the Circular Economy

- Toolkit for Policy Practices in E-Waste Management

- The e-waste value chain is described in many of the existing frameworks.
- We leveraged the value chain from the **Life Cycle Framework for E-Waste Management** as key guidance.

…As a result, we developed the Value Chain component of the new DCO framework



E-Waste Generation	Imports
	Production
	Consumption
E-Waste Processing	Collection
	Transport
	Reuse
	Disassembly
E-Waste End-of-life	Recycling
	Disposal
	Exports

The resulting value chain:

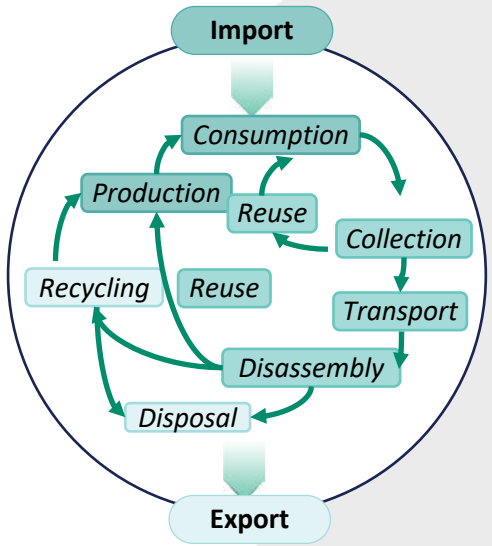
- Is **comprehensive** of all stages of e-waste management, from production to final disposal.
- **Recognizes the non-linear but circular flow** of e-waste through the value chain.
- **Includes imports and exports** of e-waste.

Key source

Although The E-Waste Value Chain Is Not Linear, We Have Described The Ten Key Steps That Governments Need To Consider To Improve E-Waste Management.

Value Chain Component: Overview

Illustrative



E-Waste Generation	**Imports**	Cross-border Import Of Used EEE Or E-Waste.
	Production	Production Of New EEE, Including Manufacturing, Import And Distribution.
	Consumption	Purchase And Use Of EEE By Consumers.
E-Waste Processing	**Collection**	Collection Of Discarded Or End-of-life EEE For Further Processing.
	Transport	Movement Of Collected E-Waste To Treatment Or Recycling Facilities.
	Reuse	Refurbishment Or Redeployment Of Used-EEE For Continued Use.
	Disassembly	Separation Of E-Waste Into Its Component Parts.
E-Waste End-of-life	**Recycling**	Recovery Of Materials From E-Waste, And Reintegration Into Manufacturing.
	Disposal	Disposal Of Non-recyclable Waste In Landfills Or Through Incineration.
	Exports	Cross-border Shipment Of E-Waste Or Recovered Materials.

The Government Mechanisms Component Focuses On Government Mechanisms To Support National And Cross-Border E-Waste Management, Consisting Of Four Subcomponents.

Framework Component Development: Mechanism Component

Illustrative

From the existing frameworks, current state and benchmarking assessments…

- Model Framework for E-Waste Management in East Africa

- Waste and Climate Change: Strategy Framework

- Toolkit for Policy Practices in E-Waste Management

- Plastic Waste Management Framework

- DCO E-Waste Mgmt. Benchmarking and Current State Reports

- Many existing frameworks identify mechanisms for e-waste management.
- The **ITU's Toolkit** for Policy Practices in E-Waste Management was **adapted according to the findings of the Benchmarking and Current-State** Assessments.

…As a result, we defined the second component, focused on government-driven mechanisms

Regulations, Policies & Strategies	Legislative
	Voluntary
Financial Instruments	Public Revenue Generation
	Investment and Financial Support
Human Capital & Awareness	Awareness
	Capabilities & Innovation
Infrastructure & Technology	Infrastructure & Equipment
	ICT and Digital Tools

The mechanisms:

- Provide **comprehensive coverage of government-driven mechanisms** for improving e-waste management.
- Include mechanisms for **national development, as well as international cooperation** (e.g., international agreements and considerations for cross-border shipment).

Key source

The “Regulations, Policies & Strategies” Ccomponent Establishes A Regulatory Framework For E-Waste Management That Guides Stakeholder Behavior.

Regulation, Policies and Strategy - Overview

Non-Exhaustive

Regulations, Policies & Strategies

This Component defines a regulatory framework for e-waste management by implementing both legislative and voluntary mechanisms to shape stakeholder actions throughout the value chain.

Legislative Mechanisms are mandatory directives issued by authorities, including regulations, policies, mandatory standards, international conventions, and bilateral agreements to ensure compliance and safety throughout the e-waste value chain.

Voluntary Mechanisms provide recommended practices, including strategies and guidelines, encouraging alignment with policy objectives and promoting responsible behavior without legal enforcement.

Regulations, Policies & Strategies are important for:

- **Providing strategic direction** on e-waste management systems and targets, placing responsibility for e-waste management on producers.
- **Ensuring compliance and safety** in e-waste management.
- **Guiding sustainable practices and setting standards** across the e-waste value chain steps and processes.
- **Defining the authority and responsibilities** of the relevant ministries and regulators, as well as the roles of other institutions (NGOs, private sector, etc.)
- **Facilitating international cooperation** to improve global recycling rates.

Success Factors

Clearly Define E-Waste And Its Governance Across Institutions And Stakeholders.

Develop Frameworks In Collaboration With Stakeholders (Both Local And International Private And Social Sectors).

Implement Necessary Systems And Allocate Resources For Enforcement.

Ensure Alignment With International Conventions And Foster Bilateral Agreements.

The “Financial Instruments” Ccomponent Establishes Investment And Funding Mechanisms To Support E-Waste Management Through Revenue Generation And Targeted Financial Support.

Financial Instruments - Overview

Non-Exhaustive

Financial Instruments

This Component creates investment and funding mechanisms to support e-waste management, facilitating revenue generation and targeted financial support to promote sustainable practices throughout the value chain.

Public Revenue Generation mechanisms create funds through taxes, tariffs, and fees to support e-waste management initiatives, ensuring a sustainable financial base for national e-waste management.

Investment and Financial Support mechanisms offer incentives like tax breaks, grants, loans, and direct investment, promoting industry participation in sustainable e-waste management practices.

Financial Instruments are important for:

- **Generating public funds** to sustain e-waste management systems, channeling the cost of e-waste management upstream in the value chain.
- **Influencing and incentivizing behavior across the e-waste value chain**, from producers to recyclers, aligned with e-waste management goals.
- **Focusing on the step** of the value chain with the biggest bottleneck.
- **Directing and incentivizing private investment** in e-waste management systems, fostering innovation and efficiency.
- **Supporting social sector** involvement in e-waste management.

Success Factors

Strike Balance Between Taxes And Investments, To Avoid The Burden On The Formal Sector And Incentivize E-Waste Flow Through The Informal Channels.

Maximize Private Investment Through Incentives And Funding Towards The Step Of The Value Chain With The Biggest Bottleneck.

Use Financial Incentives To Promote Environmentally Sustainable Behavior, Encouraging The Flow Of E-Waste From The Informal To The Formal Sector.

The “Human Capital & Awareness” Component Focuses On Building Human Capital Across The Value Chain, And On Raising Awareness Among Both Consumers And Businesses.

Human Capital and Awareness - Overview

Non-Exhaustive

Human Capital & Awareness

This Component prioritizes capability and skills development guidance for e-waste stakeholders across the value chain, while also raising awareness among consumers and businesses about the importance and urgency of e-waste management.

Capabilities & Innovation mechanisms foster skill development, support innovation, and strengthen capacity across sectors, equipping stakeholders to effectively manage e-waste.

Awareness mechanisms inform consumers and businesses in the formal and informal sectors on the environmental impacts of e-waste and promote responsible disposal practices.

Human Capital & Awareness are important for:

- **Developing capacity and capabilities**, through institutions and human capital, to manage the e-waste management system.
- **Changing consumer and business consumption and disposal** practices.
- **Empowering the informal sector,** potentially integrating it in the formal value chain.
- **Promoting and supporting innovation** across the steps of the value chain.
- **Building necessary skills** for growth and environmentally sound practices in the e-waste management sector.

Success Factors

Build And Train Necessary Government Capacity To Oversee E-Waste Management Initiatives.

Set Up Long-term Awareness Campaigns For Consumers And Businesses To Boost Collection Rates And Increase Feedstock Supply.

Collaborate Internationally For Knowledge-Sharing And Capability Building.

Run Initiatives Collaboratively With Private And Social Sectors, Enabling Innovation.

The Infrastructure And Technology Component Establishes The Physical And Digital Infrastructure And Technology Necessary For Efficient E-Waste Management.

Infrastructure and Technology - Overview

Non-Exhaustive

Infrastructure & Technology

This Component builds the essential physical and digital infrastructure, alongside technological tools, to enable effective e-waste management and support data-driven monitoring.

Infrastructure & Equipment includes essential facilities and tools, such as collection points, recycling technologies, and hazardous waste handling systems to support safe e-waste processing.

ICT and Digital tools utilize digital tools for monitoring, compliance, data management, transparency, accountability, and streamlined operations across the e-waste lifecycle.

Infrastructure & Technology are important for:

- **Streamlining and enhancing e-waste collection, processing, sorting, and recycling** to increase efficiency to improve environmental impacts by integrating advanced technologies in the processing and end-of-life steps.
- **Enabling data sharing and global collaborations thereby supporting data-driven decision-making** through centralized tracking and reporting systems, data analytics, and harmonized regulatory compliance.
- **Improving safe disposal practices** with specialized equipment to handle hazardous materials responsibly.
- **Facilitating public awareness and engagement** by making e-waste disposal accessible, leveraging digital platforms for awareness campaigns, and enabling communities to participate actively in proper e-waste management.

Success Factors

Map Value Chain Bottlenecks And Strategically Invest To Address Constraints.

Prioritize The Development Of Collection Systems Before Investing In Specialized Recycling Facilities, Ensuring Alignment Between Capacity And Feedstock.

Assess Local Infrastructure Costs Versus Outsourcing To Regional Hubs To Leverage Economies Of Scale, Particularly For Specialized Processing.

Select Context-appropriate Technology, Emphasizing Manual Processing For Job Creation Where Relevant.

The Final Framework Component, Focused On The Implementation Process, Will Be Presented Separately To Guide Countries Through A Sequenced Approach For Applying The Framework.

Framework Component Development: Process for Application

Illustrative

Guided by existing frameworks and expert interviews…

Policy Practices in E-Waste Management

Stages in the Management of ICT/UEEE and ICT/E-Waste

Curtin University

Strategic Framework for Working Toward Zero Waste Societies

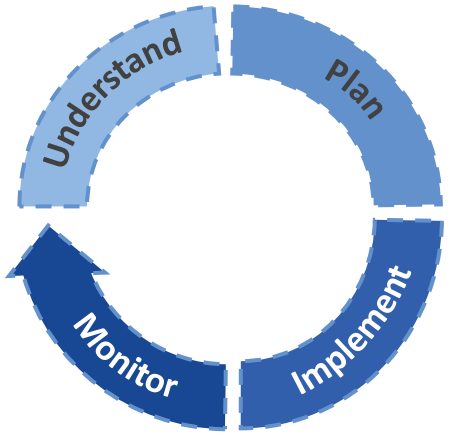
Ruediger Kuehr
Head of the SCYCLE Program - UNITAR

Otmar Deubzer
SCYCLE Senior Scientific Specialist - UNITAR

Vanessa Forti
SCYCLE Program Associate - UNITAR

- We extracted the stages from the **ITU's Handbook for the development of a policy framework on ICT/e-waste,** and adapted their focus to the new framework.

… we developed an accompanying process for the application of the new framework



1 **U N D E R S T A N D**
- Develop a clear picture of the current state of the e-waste management value chain and wider ecosystem in the country, and set up systems for continued monitoring.

2 **P L A N**
- Define desired outcomes and identify key subcomponents (and subsequent mechanisms) to create change.

3 **I M P L E M E N T**
- Implement initiatives linked to subcomponents identified in the planning stage through communication, execution, and enforcement.

4 **M O N I T O R**
- Collect data to enable continuous assessment of initiatives' impact and refine approaches.

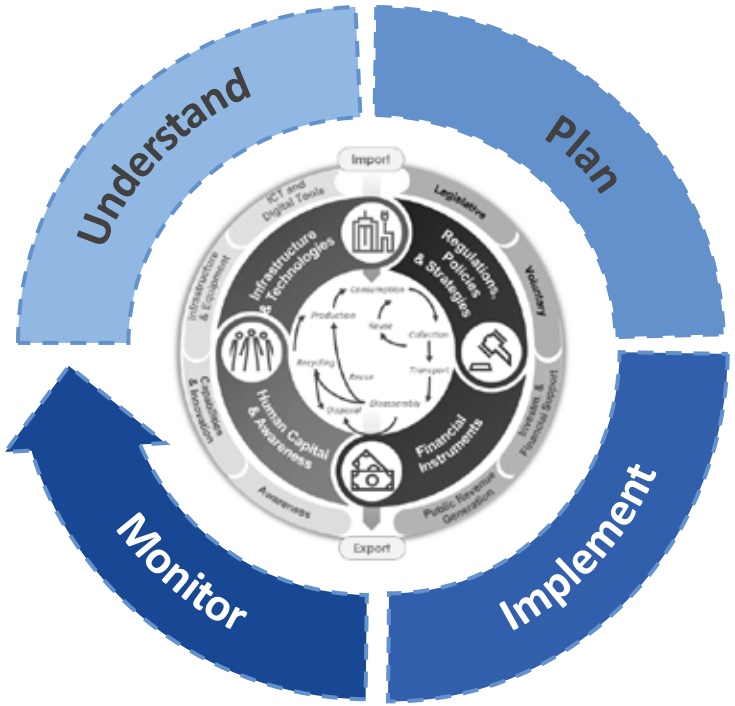
The process:
- Emphasizes the importance of **adapting the framework** based on a comprehensive understanding of individual countries' current states.
- Encourages **stakeholder engagement** across all stages of implementation.
- Promotes **quantitative and qualitative data** collection for monitoring and review.
- Establishes a **cyclical process** to support evaluation and adaptation of interventions.

Key source

To Use The Framework, A Four-step Approach Is Recommended To Ensure Effectiveness In Enhancing Up Efforts On E-Waste Management And Guiding Change In Diverse Contexts.

E-Waste Management Framework: Application Guide

Illustrative



1 UNDERSTAND
- Develop a clear picture of the current state of the e-waste management value chain and wider ecosystem in the country, and set up systems for continued monitoring of the e-waste flows, their impact, and the effectiveness of the current mechanisms.

2 PLAN
- Define desired outcomes, and identify key subcomponents (and subsequent mechanisms) to create change, consulting stakeholders, including the private and informal sectors.

3 IMPLEMENT
- Implement initiatives linked to subcomponents identified in the planning stage through communication, execution, and enforcement.

4 MONITOR
- Collect data to enable continuous assessment of initiatives' impact and refine approaches, leveraging technologies and tools, and providing visibility of stakeholders in the e-waste value chain.

Potential Mechanisms Within Each Subcomponent Are Listed, With A Description, Potential Impact, Applicability Across The Value Chain, Actions For Implementation, And Global Examples.

Overview of Framework Structure

Illustrative

Subcomponent Mechanisms

Description

Potential Impact

Value Chain Applicability

Examples of Best Practices

Action Required For Implementation

Global Examples Of Mechanisms

Regulations, Policies, and Strategies - Legislative Mechanisms (1/3)

Regulations, Policies, and Strategies - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability										
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export	
Regulations, Policies And Strategies	Legislative	**International Conventions**	Agreements Established Among Countries To Set Standards For Environmental And Waste Management.	• Promotes Global Cooperation And Establishes Consistent Standards Across Countries.	X						X	X	X	X	
		• **Basel Convention**	Regulates Cross-border Movements Of Hazardous Waste To Prevent Illegal Trafficking And Promote Environmentally Sound Management.	• Ensures Responsible E-Waste Export/Import Practices • Promotes Ethical International Collaboration.	X							X	X	X	
		Bilateral/Multilateral Agreements	Collaborative Agreements With Neighboring Or Regional Countries To Coordinate E-Waste Management Efforts.	• Facilitates Cross-border E-Waste Solutions.	X	X						X	X	X	
		General Environmental And Waste Regulations	Broad Waste Policies Applicable To Sustainability, Circularity, And Waste Management, Providing A Foundation For Specialized Regulation.	• Provides Foundational Legal Support For Waste Management.	X			X				X	X	X	
		E-Waste Specific Regulations	Legally Binding Rules Focused On E-Waste Management, Issued To Enforce Laws, And May Include Restrictions, Such As Import/Export Or Landfill Bans.	• Translates Policy Mandates Into Enforceable Actions For E-Waste Management.	X	X	X	X	X	X	X	X	X	X	
		• **Indication Of Stakeholder Obligations**	Defines The Roles, Responsibilities, And Requirements Of The Stakeholder Involved In E-Waste Management, Defining The Authorities (Ministries, Regulators, Etc.) That Have The Mandate To Enforce And Manage E-Waste.	• Enhances Role Clarity. • Ensures Accountability Across The Value Chain. • Defines Expectations Of The Different Stakeholders.	X	X	X	X	X	X	X	X	X	X	
		• **Establishment Of Recordkeeping And Reporting Requirements**	Mandates Detailed Records On E-Waste Handling, Communication Among Stakeholders, Definition Of Indicators, And Standardized Data Collection, Potentially Setting Up A Central Repository For Data And Reports' Submission.	• Supports Transparency And Traceability Not Only Towards The Authorities But Also Across E-Waste Management Stakeholders . • Enables Informed Decision-making In E-Waste Management.	X	X	X	X	X	X	X	X	X	X	
		• **Mandating Of Standards**	Defines Required Adherence To Technical Standards For EEE Production, And E-Waste Handling, Processing, And Disposal.	• Ensures Health, Safety, And Environmentally Sound Practices Are Upheld.	X	X		X	X	X	X	X	X	X	
		• **Establishment Of Targets**	Sets Clear, Measurable Targets For E-Waste Collection, Recycling, And Recovery To Guide Progress, Which Can Be Reviewed And Adjusted Periodically.	• Improves Collection And Recycling Rates And Provides Direction. • Evaluates The Effectiveness Of The Current E-Waste System.		X		X		X		X	X	X	
		• **Establishments Of Licensing Systems**	Requires That E-Waste Handlers Obtain Environmental Authorizations Or Licenses, And Establishes Auditing Processes To Ensure Compliance.	• Limits Participation To Compliant Entities, Ensuring Ease Of Monitoring And Environmentally Sound E-Waste Management.	X	X		X	X	X	X	X	X	X	
		• **Adoption Of Key Policy Measures**	Integrates Essential Policies, Such As Extended Producer Responsibility (EPR), Including Required Mechanisms And Rules To Operationalize These Policies.	• Translates Policy Objectives Into Actionable And Enforceable E-Waste Management Mechanisms.	X	X	X	X	X	X	X	X	X	X	
		• **Detailing Of Enforcement Mechanisms**	Establishes Enforcement Tools (Penalties, License Revocation), And Enforcement Roles To Ensure Compliance *(Please Refer Also To The Financial Instrument Driver).*	• Deters Non-compliance, Enhancing Regulatory Effectiveness And Accountability.	X	X	X	X	X	X	X	X	X	X	

Regulations, Policies, and Strategies - Legislative Mechanisms (2/3)

Regulations, Policies, and Strategies - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability										
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export	
Regulations, Policies And Strategies	Legislative	**Policies**	E-waste management policies are guiding principles or frameworks adopted by governments to achieve specific goals, such as sustainable production, responsible consumption, and environmentally sound e-waste management practices, and are often implemented through strategies, laws, and regulations.	• Aligns e-waste management with sustainability goals, fostering A circular economy. • Supports and guides regulatory enforcement.	X	X	X	X	X	X	X	X	X	X	
		• **Extended Producer Responsibility**	Assigns financial and physical responsibility to producers for the post-consumer treatment of their products, covering design, take-back, recycling, and disposal.	• Outsources financing and administration of e-waste management to producers. • Incentivizes waste reduction and design of sustainable products (for repair/reuse/recycle).	X	X		X	X		X	X	X		
		• **Polluter Pays Principle**	Requires polluters to bear the cost of pollution mitigation, based on the extent of damage or deviation from acceptable pollution standards.	• Deters harmful practices by making polluters financially accountable.	X	X	X	X	X		X	X	X		
		• **Waste Hierarchy**	Prioritizes waste management approaches from most to least preferable for both consumers and businesses: prevention, minimization, reuse, repair, recycling, and finally disposal.	• Promotes circularity, reducing the need for raw materials and reliance on landfills. • Increases awareness of circularity concepts beyond recycling. • Aligns stakeholders around key definitions.		X	X			X		X	X		
		• **Sustainable Production**	Supports eco-design and design for repairability, encouraging products that minimize environmental impact.	• Encourages eco-friendly production, contributing to A circular economy and reducing pressure on natural resources.		X	X								
		• **Sustainable Consumption**	Promotes decreased consumption, prioritization of sustainable products, repair before recycling, reducing waste and conserving resources.	• Encourages responsible consumption practices, reducing waste, and driving A sustainable circular economy.		X	X								
		• **Environmentally Sound E-Waste Management**	Advocates for the use of best available techniques that align with environmental and human health standards, regulating also the management of e-waste (hazardous waste) from import/collection to disposal/export.	• Mitigates health risks and environmental damage from improper e-waste handling. • Ensures alignment with the Basel convention.	X		X	X	X	X	X	X	X	X	
		• **Right To Repair (including Design For Repairability And Related Eco-Design Policies)**	Encourages (or requires) designs of electronic and electric products that simplify disassembly and component replacement and requires standards that reduce the complexity of repairs (e.g., Limiting the use of proprietary fasteners or adhesives).	• Facilitates repair of electronic and electric products, thus closing the loop early in the e-waste value chain and decreasing the volume of e-waste to be recycled or disposed of.	X	X	X	X	X	X	X				
		• **Precautionary Principle**	Requires decision-makers to adopt precautionary measures in adopting innovations when scientific evidence about an environmental or human health hazard is uncertain and the stakes are high.	• Prioritizes public health and environmental integrity in decision-making.		X		X	X	X	X	X	X		

Regulations, Policies, and Strategies - Legislative and Voluntary Mechanisms (3/3)

Regulations, Policies, and Strategies - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability									
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export
Regulations, Policies and Strategies	Legislative	**Standards**	Standards are established criteria that define specific technical, quality, and safety requirements for processes, products, or services within e-waste management. Compliance with standards can be mandated by regulations.	• Ensures consistency and compliance with policy and regulation. • Provides guidance on the required steps or mechanisms to ensure e-waste prevention and safe management.		x		x	x	x	x	x	x	
		• **Labelling Requirements for Manufacturers**	Requires ICT and electronics manufacturers to label products with disposal symbols, hazardous content details, health risks, dismantling and repair instructions, and collection point information.	• Promotes and facilitates responsible disposal by consumers and businesses. • Enhances awareness of environmental and health risks.		x								
		• **Eco-Design Standards**	Establishes design standards for EEE producers focused on durability, reparability, and recyclability, aiming to reduce e-waste generation from the outset.	• Extends product lifespans, lowering e-waste volume. • Improves recyclability and resource recovery.		x								
		• **Restriction of Hazardous Substances**	Imposes limitations on the use of harmful chemicals in electronic products to reduce environmental and health risks.	• Minimizes health and environmental risks associated with e-waste.		x								
		• **Technical Standards for E-Waste Management**	Sets requirements for safety protocols, collection, sorting, storage, transport, treatment and recycling, disposal, equipment, and personnel across the e-waste management chain.	• Ensures adoption of standardized, environmentally sound e-waste management processes. • Minimizes health and environmental risks.				x	x	x	x	x	x	
	Voluntary	**Strategies**	Strategies are structured frameworks with goals, objectives, and actions that guide decision-making in e-waste (or waste) management, coordinating resources and stakeholder efforts to achieve desired outcomes *(e.g., Circularity strategy or plan for the country to reach a circular economy by 2030, etc.).*	• Provide a clear roadmap for e-waste management (or circularity within the country or ICT sector), enabling coordinated actions and efficient resource use.	x	x	x	x	x	x	x	x	x	x
		Guidelines	Guidelines are voluntary recommendations that promote best practices in e-waste management, encouraging consistency with policy goals, in collaboration with the social sector and international organizations.	• Support alignment with best practices in e-waste management • Facilitate initial steps in standardization and capacity building for sustainable e-waste management.		x	x	x	x	x	x	x	x	

NOTES from Experts and Roundtable Feedback: E-Waste regulations should be aligned with legislation regarding Critical Raw Materials (CRM). While electronics and electrical products are just a small part of the broader Critical Raw Materials (CRM) frameworks, they might help drive the recycling rate. Conversely, if CRM regulations are not designed properly, they might disincentivize the export of used EEE to developing countries to bridge the digital divide, as developed countries might push for extracting CRM from used EEE rather than repairing and reusing them in markets outside their national boundaries.

Regulations, Policies, and Strategies – Examples of Best Practices (1/2)

Regulations, Policies and Strategies: Examples of Best Practice

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Regulations, Policies and Strategies	Legislative	**International Conventions**	1. Review current international conventions on e-waste to ensure alignment with global standards and best practices. 2. Establish outstanding memberships and address any gaps in compliance to facilitate responsible e-waste management. 3. Develop national regulations and processes to meet Basel Convention requirements, focusing on safe, legal cross-border movement of e-waste and reducing environmental impacts.	• The Basel Convention has been ratified by over 180 countries globally, including all of the DCO's Member States, and is an international treaty that regulates the transboundary movement of hazardous wastes, including e-waste, to protect human health and the environment.[1]
		Bilateral/Multilateral Agreements Deep-dive to follow	1. Identify neighboring or regional countries with shared e-waste management goals. 2. Develop agreements that coordinate e-waste management, allowing shared resources for processing and compliance monitoring. 3. Ensure compliance with international conventions and alignment with national regulation.	• A bilateral agreement exists between the United States and Malaysia, which establishes procedures for the controlled transboundary movement of hazardous wastes from Malaysia to the U.S., ensuring compliance with environmental standards and the Basel Convention.[2]
		General Environmental And Waste Regulations	1. Evaluate current regulations, consulting with experts, international organizations, and stakeholders within the national value chain. 2. Benchmark existing regulations adopted by other countries, and evaluate the need for e-waste specific one. 3. Draft or modify regulations that cover waste management, including sustainability and circular economy principles, adopting global best practices and addressing the feedback received by the community. 4. Develop specific legislation targeting the e-waste lifecycle from production to end-of-life management, which may include restrictions on import and export of e-waste or ban of the landfill.	• Finland has issued regulations on waste, more generally, including The Waste Act (2011) which provides the legal framework for Extended Producer Responsibility, as well as decrees providing limits on landfills and waste incineration.[3]
		E-waste Specific Regulations		• Finland's **Decree on Waste Electrical and Electronic Equipment 519/2014** implements the requirements of the EU WEEE. It provides specific regulations on the collection, treatment, recycling, and recovery of e-waste.[4]
		Policies • **Extended Producer Responsibility** • **Polluter Pays Principle** • **Waste Hierarchy** • **Sustainable Production And Consumption** • **Environmentally Sound E-waste Management** • **Precautionary Principle** • **Right To Repair**	1. Evaluate current national policy frameworks for e-waste, if established, and collect feedback from the private and social sector on the current challenges and opportunities that the policies create. 2. Evaluate the current enforcement and effectiveness of the policies, identifying the factors contributing to their successful adoption. 3. Benchmark other countries on best practices and policy standards. 4. Draft changes or new policies according to the relevant principles, in consultation with the relevant ministries and stakeholders. 5. Perform an impact analysis and evaluate success implementation factors.	• The European Union's WEEE Directive, which sets rules for e-waste management in EU states, incorporates all of these policy principles.[5]

1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, https://www.basel.int/
2. Agreement between the government of the United States of America and the government of Malaysia https://www.basel.int/Portals/4/Basel%20Convention/docs/article11/malaysia-us.pdf
3. Waste Act (646/2011), https://finlex.fi/en/laki/kaannokset/2011/en20110646.pdf
4. Decree on Waste Electrical and Electronic Equipment (519/2014), Finland, https://www.finlex.fi/fi/laki/kaannokset/2014/en20140519_20211026.pdf
5. DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0019

Regulations, Policies, and Strategies – Examples of Best Practices (2/2)

Regulations, Policies and Strategies: Examples of Best Practice

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Regulations, Policies and Strategies	Legislative	**Standards**		
		• **Labelling Requirements for Manufacturers**	1. Analyze the current standards that would impact e-waste, as also the global best practices and lessons learned on labelling, eco-design, transportation of hazardous waste, etc. 2. Consult with the electronics producers on their point of view and concerns regarding the considered standards. 3. Consult with the e-waste value chain actors to identify the challenges and opportunities of the standards, as well as the barriers and key success factors for implementation. 4. For each standard, draft the proposal and share it with the private and social sector, as well as with experts on the field. If possible, also with allied nations, to integrate their experience. 5. Validate each standard with a business case evaluation, assessing whether to proceed and how. 6. Publish the standards and launch a communication campaign to ensure the public is aware of them and they understand how to apply them.	The EU's WEEE Directive requires that the 'WEEE marking' must appear on any electrical and electronic equipment placed on the EU market, to indicate that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.[1]
		• **Eco-Design Standards**		• Taiwanese government has established legislation, requiring manufacturers and importers of electronic goods to design products with recycling in mind.[2] • The EU's Eco-design Directive established a framework for EU states to set eco-design requirements for energy-related products, including electronics, which include increasing recyclability and decreasing waste production.[3]
		• **Restriction of Hazardous Substances**		• The Restriction of Hazardous Substances (RoHS) Directive in the EU, and the SASO Technical regulations in Saudi Arabia limit the use of specific hazardous materials in the manufacturing of electronic and electrical equipment.[4]
		• **Technical Standards for E-Waste Management**		• The European standards EN 50625 and EN 50614 for WEEE lay down specifications expressly designed to put WEEE legislation into practice and cover the process of collection, transport, re-use and treatment of WEEE.[5]
	Voluntary	**Strategies**	1. Evaluate the definition of broad Circularity, e-waste management strategies or guidelines that provide guidance to the different stakeholders of the value chain on where to focus the efforts and how to tackle this issue, complementary the current regulatory and policy framework. 2. Consult and collaborate with the stakeholders to get their input, especially with the ministries and municipalities that would then be the advocate for this strategies. 3. Collaborate with academics, experts, and international institution to collate global best practices and adapt them to the local context. 4. Ensure guidelines are accessible to the public, and set up a communication campaign to increase awareness of their publication.	• The Regional E-Waste Management Strategy, developed by the East African Communications Organization outlines priority objectives for the region, and actions to achieve target outcomes/indicators. Necessary funding and capacity building mechanisms and stakeholder roles and responsibilities are also detailed.[6] • The Finnish Strategic Program to Promote a Circular Economy sets the goal for Finland to be circular economy leader by the mid-2030s. It outlines specific goals, commits to initiatives and policy measures, and covers economic incentives, regulations & standards, research & innovation funding, and education & awareness.[7]
		Guidelines		• Kenya's Guidelines for E-Waste Management (2011) provide a framework for safe handling, collection, and disposal of electronic waste to reduce environmental impact.[8]

1. Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)Text with EEA relevance
2. E-Waste: 5 ways to boost e-recycling and why it matters | World Economic Forum, 2024
3. Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products Text with EEA relevance
4. Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS), https://environment.ec.europa.eu/topics/waste-and-recycling/rohs-directive_en
5. EU-wide uniform conditions for the proper quality treatment of WEEE, Joint-industry-comments_EU-wide-uniform-conditions-for-WEEE-quality-treatment_2019-12-12_final.pdf
6. Regional E-Waste Management Strategy, East African Communications Organization, 2017
7. Leading the cycle – Finnish road map to a circular economy 2016-2025 | European Circular Economy Stakeholder Platform
8. Guidelines for E-Waste Management in Kenya, National Environment Management Authority, Microsoft Word - E-Waste Guidelines final copy27jan2011.doc

Deep-Dive: Bilateral Agreements

Designing An E-Waste Trade Agreement Requires Alignment With A Partner Country That Complements National Priorities And Offers Potential For Mutual Benefit.

The Recommended Actions For The Development of a Bilateral Agreement for E-Waste Trade

Non-Exhaustive

1	2	3	4
Evaluate national needs for e-waste import (e.g., shortage of feedstock for recycling facilities) **or export** (e.g., lack of domestic recycling facilities)	**Select a partner country that can address these needs**, with priority given to nearby countries to minimize the footprint of e-waste transport	**Ensure compatibility and compliance** with both **national regulations and international conventions**, including the Basel Convention	**Develop a mutually beneficial agreement** that supports both countries' e-waste management goals




Deep-Dive: Bilateral Agreements

To Develop Such An Agreement, First Identify Gaps In Domestic E-Waste Management Capability And Capacity, And Identify Partner Countries With The Potential To Support These Gaps.

Basel Convention Overview

Non-Exhaustive

STEP 1 & 2	KEY QUESTIONS				
Evaluate National Needs For The E-waste The Import Or Export. 01	What specific gaps in capacity or capabilities exist within domestic e-waste management infrastructure? 1	Does this gap pertain to all e-waste categories, or is it specific to certain types or components (e.g., small ICT, plastic components, batteries)? 2	Would we be better suited for import or export of e-waste/e-waste components? 3	What volume of e-waste is projected for trade, and over what timeframe? 4	What value can we offer to the partner country? 5
Select A Partner Country That Addresses These Needs, Prioritizing Nearby Countries To Minimize The Footprint Of E-waste Transport. 02	Which countries have the necessary e-waste processing capabilities or resources that complement our identified needs? 1	How aligned are the prospective partner country's e-waste regulations, standards, and compliance practices with our own? 2	Can the partner country ensure that e-waste import/export will comply with Basel Convention requirements? 3	Do we already have established diplomatic or trade relations with these countries? 4	Which ministry or governmental body would be the appropriate point of contact to initiate discussions for a potential bilateral agreement? 5

Deep-Dive: Bilateral Agreements

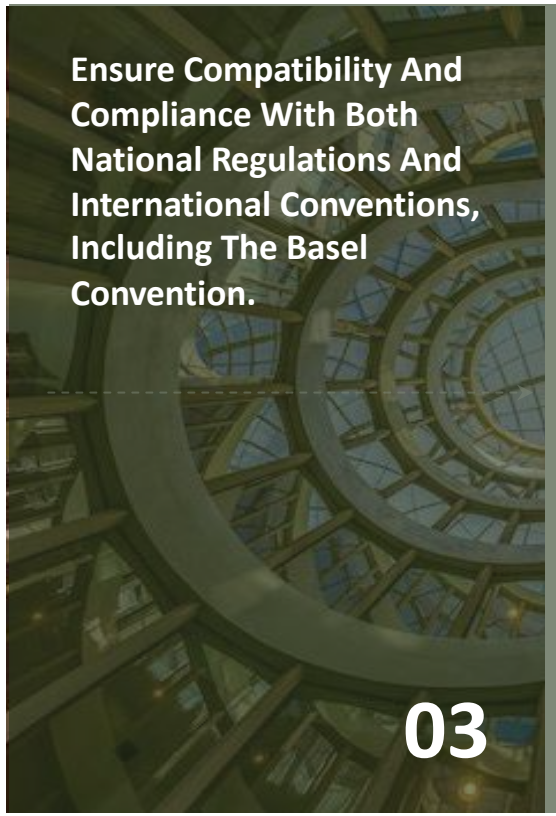
The Basel Convention, An International Treaty Regulating The Transboundary Movement Of The Hazardous Waste, Should Be Which Considered When Drafting Bilateral E-Waste Agreements.

Basel Convention Overview

Non-Exhaustive

STEP 3

BASEL CONVENTION: OVERVIEW



Ensure Compatibility And Compliance With Both National Regulations And International Conventions, Including The Basel Convention.

03

OBJECTIVES	FUNDAMENTALS	ESSENTIAL MECHANISMS
Reduce the **generation** of hazardous waste.	An international treaty established in **1989**, which entered into force in **1992.**	**Prior Informed Consent (PIC)** procedure, requiring that any country intending to export hazardous waste must obtain permission from the receiving country.
Restrict and regulate transboundary movements of hazardous waste.	Over **180** countries adhere to it, including the DCO Member States.	**Environmentally sound management (ESM)** of hazardous waste, establishing practices and facilities across waste management processes that minimize harm to the environment and human health.
Promote **the environmentally sound management** of hazardous waste.	Targets the transboundary flow of hazardous waste, including **e-waste.**	

1. The Basel Convention also focuses on hazardous waste, which includes e-waste

Source: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, https://www.basel.int/

Deep-Dive: Bilateral Agreements

A Bilateral Agreement Must Meet Four Main Conditions, Including Obtaining Prior Informed Consent And Ensuring Environmentally Sound Management.

Basel Convention Overview

Non-Exhaustive

STEP 3

Ensure Compatibility And Compliance With Both National Regulations And International Conventions, Including The Basel Convention.

03

BASEL CONVENTION: COMPLIANCE CONDITIONS

1. **Obtain Prior Informed Consent** from BOTH countries and notification to the Secretariat of the Basel Convention.

2. Guarantee that the **importing country uses environmentally sound management (ESM) practices**, aligning with local laws and Basel Convention guidelines.

3. Ensure **commitment** from both countries to **manage the e-waste** (package, label, transport, etc.) in accordance with the Basel Convention.

4. **At least one** of the following criteria should be met:
   1. **Export country** does not have **adequate facilities, capacity, or suitable disposal sites** to dispose of the e-waste in question in an environmentally sound and efficient manner.
   2. **The** waste in question is **required as raw material** for recycling or recovery industries in the State of Import.
   3. **The transboundary movement is in accordance with other criteria to be decided by the parties** (provided they do not differ from the Basel Convention's objectives).

1. The Basel Convention is focused on hazardous waste, which includes e-waste

Source:, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, https://www.basel.int/

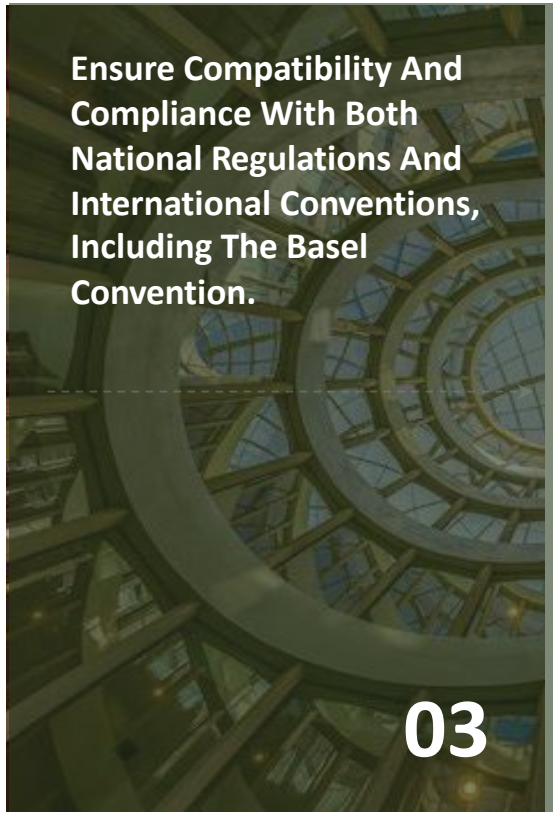
Deep-Dive: Bilateral Agreements

Bilateral Agreements Must Stipulate Provisions Which Are Not Less Environmentally Sound Than Those Provided By The Basel Convention.

Examples of ESM conditions

Non-Exhaustive

STEP 3	BASEL CONVENTION: CONDITIONS FOR ESM[1]



A **Legal framework** and capacity for implementation

Clearly defined **legal framework** for waste management	**Regulation of stakeholders** and management **facilities**	**Licensing and documentation** requirements for e-waste transport	Pollution control and labor safety **standards**	**Enforcement** systems and capacity

B National waste **management capacity for different waste streams**

Capacity should be sufficient to manage **E-Waste generated, plus imports, minus exports.**	This capacity should **meet the recommendations of the Basel Convention's** technical guidelines on e-waste and other waste streams.

C **Additional measures** to promote ESM

National waste management **strategy**	**Awareness-raising** mechanisms	**Incentives** to improve e-waste management **performance**	**Incentives** to transform the **informal e-waste management sector**

Source: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, https://www.basel.int/

Deep-Dive: Bilateral Agreements

Bilateral Agreements Typically Include Core Articles That Define The Scope, Obligations, Procedures, Standards, And Conditions Of The Agreement.

Core Articles of a Bilateral Agreement for E-Waste Trade (1/3)

Non-Exhaustive

STEP 4	CORE ARTICLES OF THE AGREEMENT
Develop A Mutually Beneficial Agreement That Supports Both Countries' E-waste Management Goals. 04	**1** **Scope and Definitions:** Delineates the types of electronic waste covered under the agreement and provides precise definitions to ensure mutual understanding between the parties.
	2 **Obligations of the Parties:** Outlines the responsibilities of each party, including commitments to minimize e-waste generation, ensure proper recycling/disposal, and prevent illegal movements.
	3 **Transboundary Movement Procedures:** Establishes protocols for e-waste import and export, including notification, consent, and documentation procedures to ensure legal, transparent movements.
	4 **Alignment with International Agreements:** Clarifies that the agreement should not override each party's obligations under international agreements, such as the Basel Convention (ESM[1] standards etc.).
	5 **Information Exchange and Cooperation:** Encourages information sharing related to e-waste management practices, technologies, and policies, and promotes collaborative improvement efforts.
	6 **Administrative Conditions:** Confirms the nature of the agreement's (1) entry into force, (2) amendment process, (3) dispute settlement process, (4) agreement validity and termination process.

1. Environmentally Sound Management

Deep-Dive: Bilateral Agreements

The First Three Core Articles Typically Clarify The Agreement's Scope And Definitions And Outline The Obligations And Expected Procedures For Conducting Cross-border E-Waste Trade.

Core Articles of a Bilateral Agreement for E-Waste Trade (2/3)

Non-Exhaustive

STEP 4

Develop A Mutually Beneficial Agreement That Supports Both Countries' E-waste Management Goals.

04

CORE ARTICLES OF THE AGREEMENT

Article	1	2	3
	Scope and Definitions	**Obligations of the Parties**	**Transboundary Movement Procedures**
	Clarifies the objective of the agreement, typically to ensure the environmentally sound management of e-waste and to prevent the illegal cross-border movement of hazardous electronic waste between the two countries. It also defines the types of waste covered.	Outlines the obligations of each party under the agreement, including compliance with environmental standards, proper handling and recycling processes, and adherence to the agreed-upon procedures for e-waste transport and disposal.	Specifies the steps that must be taken to move e-waste across borders. It often includes details about notification procedures, requirements for written consent, commitments to reimport waste, and necessary documentation for the export or import of e-waste.
Example	"The purpose of this Agreement is to ensure that the transboundary movement and disposal of electronic waste between [Country A] and [Country B] are conducted in an environmentally sound manner, in compliance with the principles outlined in the Basel Convention and relevant national legislation".	"Each Party shall ensure that all transboundary movements of electronic waste are authorized and conducted in accordance with national regulations and that waste exporters have obtained prior informed consent from the competent authority of the importing Party. Each Party shall take necessary measures to minimize the generation of e-waste and promote its recycling, recovery, and environmentally sound disposal."	"Any transboundary movement of electronic waste covered by this Agreement shall be subject to a prior written notification by the competent authority of the exporting Party and the prior written consent of the competent authority of the importing Party. A consignment shall be accompanied by appropriate documentation, including information on the nature, quantity, and destination of the waste."

Deep-Dive: Bilateral Agreements

The Latter Three Core Articles Focus On Promoting Environmentally Sound Cooperation Through Information Exchange And The Administrative Conditions Of The Agreement.

Core Articles of a Bilateral Agreement for E-Waste Trade (3/3)

Non-Exhaustive

STEP 4

Develop A Mutually Beneficial Agreement That Supports Both Countries' E-waste Management Goals.

04

CORE ARTICLES OF THE AGREEMENT

Article	4	5	6
	Alignment with International Agreements	**Information Exchange and Reporting**	**Administrative Conditions[1]**
	Clarifies that the agreement should not override either party's obligations under existing or future international agreements, and frequently references the Basel Convention and ESM principles adapted to the bilateral context.	Promotes cooperation between countries by requiring regular information sharing about e-waste management practices, policies, and compliance efforts. It may also include provisions for reports or data exchange on amounts of e-waste processed or transported.	Outlines the mechanisms for the resolution of disputes, outlines a mutual process for amendments, specifies activation requirements, and defines the agreement's duration and termination conditions.
Example	"Both Parties commit to applying ESM practices for e-waste as defined by the Basel Convention, ensuring that all facilities involved in the recycling, recovery, and disposal of e-waste adhere to these principles. Each Party shall incorporate ESM standards within its national legislation".	"The Parties shall exchange relevant information on the quantities, categories, and management practices for e-waste within their jurisdictions. Annual reports shall be submitted by each Party detailing the amount of electronic waste imported, exported, and disposed of, including documentation of compliance with the conditions set forth in this Agreement".	"This Agreement may be amended by the written consent of the Parties." "This Agreement shall enter into force on the date of the written notification by the Parties through diplomatic channels…" "This Agreement shall remain in force indefinitely unless terminated in writing by either Party through diplomatic channels".

1. These conditions are typically split up into four separate articles: Dispute Settlement, Amendment, Entry into Force, and Validity and Termination

Deep-Dive: Bilateral Agreements

Several Bilateral Agreements Have Been Established To Facilitate Hazardous Waste Trade Between Nations, Offering Valuable Guidance For Developing An E-Waste-specific Agreement.

Bilateral Agreement Example

Example, Non-Exhaustive

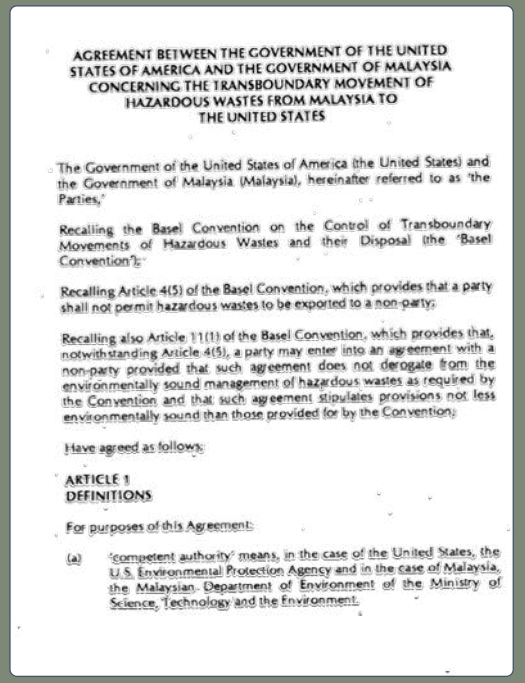
STEP 4

Develop A Mutually Beneficial Agreement That Supports Both Countries' E-waste Management Goals.

04

EXAMPLE AGREEMENT

USA - Malaysia



AGREEMENT BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERNMENT OF MALAYSIA CONCERNING THE TRANSBOUNDARY MOVEMENT OF HAZARDOUS WASTES FROM MALAYSIA TO THE UNITED STATES

The Government of the United States of America (the United States) and the Government of Malaysia (Malaysia), hereinafter referred to as 'the Parties,'

Recalling the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (the 'Basel Convention');

Recalling Article 4(5) of the Basel Convention, which provides that a party shall not permit hazardous wastes to be exported to a non-party;

Recalling also Article 11(1) of the Basel Convention, which provides that, notwithstanding Article 4(5), a party may enter into an agreement with a non-party provided that such agreement does not derogate from the environmentally sound management of hazardous wastes as required by the Convention and that such agreement stipulates provisions not less environmentally sound than those provided for by the Convention;

Have agreed as follows:

ARTICLE 1
DEFINITIONS

For purposes of this Agreement:

(a) 'competent authority' means, in the case of the United States, the U.S. Environmental Protection Agency and in the case of Malaysia, the Malaysian Department of Environment of the Ministry of Science, Technology and the Environment;

PURPOSE

"Provide A Framework For The Transboundary Movement Of Hazardous Wastes That Are Shipped From Malaysia To The United States For Management".

GENERAL OBLIGATIONS

- Compliance With The Basel Convention
- Notification And Consent
- Conditions For Shipment
- Cooperative Oversight Of Hazardous Waste Movements
- Duty To Re-import
- Shipment Insurance Requirements
- Amendment And Termination Terms

Financial Instruments – Public Revenue Generation And Investment And Financial Support Mechanisms

Financial Instruments - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability										
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export	
Financial Instruments	Public Revenue Generation	• **Extended Producer Responsibility Fees**	Producers pay fees to Producer Responsibility Organizations or the government for managing e-waste from their products, often calculated based on the percentage of product collected based on their market share. Governments may also to support (e.g., initially subsidize) Take-Back Programs to producers and/or retailers involved in the e-waste value chain, helping them to set up and operate take-back systems.	• Funds collection and processing of e-waste. • Promotes eco-design by reducing fees on environmentally friendly products. • Enables repair and reuse of electronic and electric products.		X		X	X	X					
		• **Consumer Disposal Fees**	Consumers are charged when discarding specific electronic devices to cover recycling and disposal expenses.	• Offsets costs for e-waste recycling and safe disposal.				X							
		• **Eco-levy on Import**	A tariff is applied to imported electronics, with collected funds directed toward domestic e-waste management programs.	• Generates additional funding for local e-waste management initiatives, proportional to electronics import quantities.	X										
	Investment and Financial Support	• **Public Private Partnerships**	Collaborative agreements that leverage private sector capabilities to enhance government capacity for efficient e-waste management, sharing both costs and responsibilities.	• Incentivizes private companies by expanding market opportunities, and potentially providing financial incentives such as results-based financing • Supports public sector resource efficiency.	X			X	X	X	X	X	X	X	
		• **Tax Incentives and Deductions**	Tax incentives and deductions are provided for activities related to e-waste recycling, for the production and purchase of Eco-Friendly Products, and sustainable and recyclable electronics, and for sustainable practices.	• Reduces financial barriers, encouraging increased investment in sustainable e-waste practices, services and infrastructure.		X	X	X	X	X	X	X			
		• **Cash Incentives**	Cash payments are normally offered to scrap dealers and informal collectors to increase e-waste collection and recycling rates.	• Boosts e-waste collection by directly rewarding recycling efforts • Supports the integration of informal actors by increasing the financial attractiveness of the formal value chain.				X							
		• **Reduced Tariffs for Recycling Equipment**	Lowering import tariffs on certain recycling/disassembly technology and machinery reduces costs of innovation and promotes investments in Capital Expenditure.	• Reduces cost of recycling infrastructure investment, promoting sector growth and innovation.							X	X			
		• **Grants and Subsidized Loans**	Financial assistance provided by the government supports e-waste management initiatives in the private and social sectors across the value chain. Funds should also promote R&D of technologies and tools across the e-waste value chain (e.g., eco-design, sorting, repairing, upcycling, recycling, and reuse of recycled materials to produce new electronic products).	• Strengthens sector capacity by funding essential infrastructure and public awareness efforts.		X	X	X	X	X	X	X	X		
		• **Investment in Governmental Facilities**	Government investment can be directed toward developing critical e-waste management infrastructure to establish a sustainable system.	• Accelerates the creation of foundational infrastructure for effective e-waste management.		X		X	X	X	X	X	X	X	

Financial Instruments – Examples of Best Practices

Financial Instruments

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Financial Instruments	Public Revenue Generation	• **Extended Producer Responsibility Fees**	1. Analyze the different fees or levies that governments globally implement to address issues and promote changes in the e-waste value chain. 2. Define which part of the value chain is a priority to tackle (e.g., Disposal vs Import) and perform a financial analysis on the potential fees' options. 3. Identify key characteristics of the fees: Who is the target, How much would it be/how is it structured, Who will enforce it, what is the impact on the economics of the e-waste value chain tool, etc. 4. Build the business case, estimating the revenue that would be generated. 5. Evaluate risks and opportunities for a fee (potentially increase formal sector cost, thus not discouraging the formal sector. 6. Identify the type of initiatives that the government wants to push forward.	• In Switzerland, the Ordinance on the Return, Take-Back, Disposal of Electrical & Electronic Equipment mandates that manufacturers/importers of electronic goods finance e-waste collection and recycling.
		• **Consumer Disposal Fees**		• Under Japan's home electric appliances (HEA) recycling policy, consumers pay a recycling fee when discarding four types of HEA waste: TVs, refrigerators, washing machines, and air conditioners.
		• **Eco-levy on Import**		• In Ghana, producers, distributors, and retailers are required to pay an eco-levy for EEE imports to account for e-waste produced at end-of-life.
	Investment and financial support	• **Public Private Partnerships**	1. Once a specific need in terms of financing / capacity building (e.g., set up of new recycling facilities) and evaluate the key partners.	• The City of New York Department of Sanitation established a public-private partnership with Electronics Recyclers International (ERI) for the collection and recycling of e-waste from residents.
		• **Tax Incentives and Deductions**	1. Benchmark similar practices for countries around the world. 2. Define the objective of the tax incentives and deductions. 3. Build the business case around it.	• The State of New York offers tax credits and incentives for businesses that engage in e-waste recycling • The Finnish government is considering tax incentives such as: making recycling sector activities eligible for a lower taxation bracket to encourage more investment from profitable operations within Finland.
		• **Cash Incentives**	1. Identify the market's need and structure cash incentives to drive changes. 2. Complete the business case to ensure financial sustainability. 3. Potentially identify an NGO to support the development and feedback.	• In Ghana, the National Incentive Payment System for Electronic Waste (NIPSEW) promotes collection and recycling by offering scrap dealers a price for eligible types of e-waste and subsidizes the collection and additional costs associated with recycling.
		• **Reduced Tariffs for Recycling Equipment**		• The Environmental Goods Agreement, developed by the World Trade Organization, reduces tariffs on import of eco-friendly products, including goods that support recycling and mitigate pollution.
		• **Grants and Subsidized Loans**	1. Identify the market needs, like capability building or awareness, identifying those activities across the value chain, where grants fit better (e.g., awareness campaign, capability building, etc.). 2. Design the products and partner with NGOs or banks for implementation.	• In 2018, the Kuwaiti National Fund for Small and Medium Enterprises Development funded Tadwire, an e-waste recycling company, to construct Kuwait's 1st specialized facility for recycling e-waste. • The Qatar Development Bank (QDB) supports businesses that focus on sustainability, including e-waste management, by offering subsidized loans, grants, and incubation programs to stimulate innovation.
		• **Investment in Governmental Facilities**	1. Identify the needs in the market for capital investment. 2. With the support of an investment fund or a gov. entity design investment products and outsource them the disbursement and monitoring.	• In 2017 the Saudi Investment Recycling Company (SIRC) was established as an owned subsidiary of the Public Investment Fund (PIF). It is the largest industrial waste management company in the GCC with a fully integrated platform to handle, store, transport, treat, and safely dispose of the hazardous waste.

1. Electronic Waste Recycling Act of 2003, Electronic Waste Recycling Statutes - CalRecycle Home Page
2. Law for the Recycling of Specified Kinds of Home Appliances, 08.pdf
3. Electrical and electronic equipment, Federal Office for the Environment, Electrical and electronic equipment
4. E-Waste law: Ghana government to collect eco-levy on additional 300 electric products - Ghana Business News, 2022
5. ecycleNYC, NYC Department of Sanitation, ecycleNYC – DSNY
7. Environment Ministry launches E-Waste incentive payment system | Ghana News Agency, 2020
8. The WTO Environmental Goods Agreement: Why Even A Small Step Forward Is a Good Step, World Bank, 2014
9. Tadwire – We Work Toward A Zero Waste Kuwait
10. Qatar Development Bank
11. Saudi Investment Recycling Company, SIRC - Home

Human Capital And Awareness - Capabilities And Innovation Mechanisms

Human Capital and Awareness - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability									
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export
Human Capital and Awareness	Capabilities and Innovation	**Skill Building and Innovation**	Programs and resources aimed at developing skills and fostering innovation across the value chain.	**Develop capabilities in:** • **Eco-design and sustainable manufacturing,** to train manufacturers in designing durable, repairable, and recyclable products. • **E-Waste management operations,** to develop skills in efficient and environmentally sound e-waste collection, sorting, processing, and disposal methods. • **Regulation development and enforcement,** to increase the effectiveness of regulation and improve industry compliance. • **Entrepreneurial skills and business development,** to encourage entrepreneurship in resource recovery, repair, and refurbishment sectors. • **Data management and reporting,** to enhance data-driven decision-making and transparency in e-waste management. • **Research and development in recycling technology,** to support innovation in manufacturing, and e-waste management.		X		X		X	X	X		
		• **Capability Building Programs**	Promote and conduct training programs on eco-design, e-waste management, monitoring, and entrepreneurship for specific sectors, targeting both the youth and employees or leadership of electronics and e-waste businesses, ideally supported by universities or NGOs. These programs might also target the informal e-waste sector to adopt safer and more efficient recycling best practices and procedures.			X		X		X	X	X		
		• **Integration into Curricula**	Incorporate e-waste management concepts and technical skills into educational curricula at schools and universities.			X		X		X	X	X		
		• **Industry-Specific Certification Programs**	Develop and promote certification courses on e-waste handling, hazardous material disposal and equipment/infrastructure development and management, in collaboration with academic institutions. They would help to standardize and enhance the industry expertise in e-waste management standards and best practices.			X		X	X	X	X	X		
		• **Thought Leadership and Academic Research**	Support NGOs, universities and institutes to research on e-waste innovation topics, and to publish guidelines on e-waste practices, monitoring protocols, latest technologies and tracking techniques.			X		X	X	X	X	X	X	
		Capacity Building	Building institutional capacity is critical for governments to establish, manage, and sustain an effective e-waste management system.	**Key capacities to develop include:** • **Regulation and Licensing:** Designate bodies for compliance, auditing, import/export oversight, and licensing. • **From National to Municipal Services:** Build both national and local capacity for e-waste collection and disposal services. • **Data and Reporting:** Establish systems for consistent e-waste data collection and reporting to increase visibility of the e-waste flow across the value chain. • **Stakeholder Engagement:** Equip agencies to collaborate with industry, NGOs, and the public on e-waste initiatives. • **EPR Administration:** Develop mechanisms to monitor compliance and manage EPR funding models (state-managed, industry-led PRO, or compliance service provider models).	X			X	X	X	X	X	X	X
		• **Establish dedicated capacity within government bodies**	Establish capacity within dedicated public institutions responsible for overseeing, regulating, and supporting e-waste management processes, ensuring compliance and fostering sustainability across the e-waste lifecycle, and a fostering continuous improvements and a learning mindset.		X			X	X	X	X	X	X	X
		• **Outsource capacity to the private sector**	Engage private sector expertise through outsourcing arrangements to expand capacity, improve efficiency, and introduce innovative solutions in e-waste collection, processing, and disposal. This includes the use of Producer Responsibility Organizations (PROs) to manage Extended Producer Responsibility.		X			X	X	X	X	X	X	X

Human Capital And Awareness - Awareness Mechanisms

Human Capital and Awareness - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability									
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export
Human Capital and Awareness	Awareness	**Communication, Information and Awareness Initiatives**	Initiatives focused on using government and media channels to inform the public on e-waste issues, policies, and regulations, available resources, and responsible disposal practices, targeting the private, public and social sectors.	Build awareness of: • **Environmental impact of e-Waste:** Inform the public and businesses about pollution and resource depletion linked to e-waste to encourage sustainable practices. • **Benefits of proper recycling:** Inform businesses and consumers about economic and environmental gains from recycling. • **Available collection facilities:** Raise awareness of accessible e-waste collection points. • **Promotion of repair and reuse and circularity overall:** Encourage repair and reuse to extend product life and reduce waste. • **Business responsibility:** Increase business awareness of sustainable e-waste practices and corporate social responsibility. • **Regulations and policies:** Educate stakeholders on e-waste regulations, highlighting compliance benefits and legal consequences for all actors. • **Environmentally sound practices**: Educate processors on safe disposal practices, emphasizing health risks and environmental impacts of informal processing.			x	x		x	x			
		• **Public Service Announcements, Awareness and Behavioral Change Campaigns**	Use government channels, dedicated communication bodies, consumer media, and public spaces to broadcast messages on e-waste management (new policies, new initiatives, reminders of deadlines for submitting the reports, etc.) and to educate consumers on the importance of e-waste management and available disposal options. Campaigns might also aim to promote behavioral change in the society, by promoting responsible consumer habits, such as reducing, reusing, and recycling electronics, but this should be supported by other policies targeting the production and repair of products themselves (e.g., EPR, eco-design, etc.).				x	x		x	x			
		• **Resources on Government Websites**	Provide accessible e-waste information, including disposal locations and best practices, on official websites, and encourage private and social sectors to provide information to enhance content and awareness.				x	x		x	x			
		Community Engagement	Engagement activities designed to involve the public and local leaders in e-waste education, awareness, and disposal efforts.				x	x		x	x			
		• **Visible E-Waste Initiatives**	Establish visible e-waste collection points in high-traffic areas, simplifying disposal and encouraging public participation.					x						
		• **Community Workshops and Events**	Organize workshops on e-waste hazards, safe disposal, and involve local leaders to broaden engagement.				x	x		x	x			
		Educational Programs	Incorporation of e-waste education in schools and universities, either in existing curricula or through an ad-hoc specialized course/intervention.				x	x		x				

Human Capital And Awareness – Examples Of Best Practices (1/2)

Human Capital and Awareness

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Human Capital and Awareness	Capabilities and Innovation	**Skill building and innovation**		
		• **Capability Building Programs**	1. Identify the needs in terms of capabilities, skills, and capacity of the e-waste value chain in collaboration with the social sector. 2. Work with NGOs and universities to identify existing degrees/ programs where additional curricula around e-waste management can be included. 3. Finance entrepreneurship or capability programs targeting those steps of the value chain that need to be strengthened. 4. Set up processes to measure the social and economic impact of these programs, and improve their design and delivery based on feedback.	Ghana's Ministry of Environment, Science, Technology and Innovation (MESTI) organized a 5-Day training workshop in August 2022 to build capacity on e-waste management and develop by-laws for effective collaboration between Municipal, Metropolitan, and District Assemblies (MMDAs) and stakeholders in sustainable e-waste practices.[1]
		• **Integration into Curricula**		Many universities globally have integrated sustainability and eco-design modules into their degree offerings, particularly in Electrical and Electronic Engineering, which have become more useful and recognized skills as global e-waste policy and regulation have developed.
		• **Industry-Specific Certification Programs**	1. Identify certification agencies that are willing to step up efforts within the countries, working with them in a communications campaign to increase awareness. 2. Evaluate the sponsorship of certain certification programs, potentially targeting the informal sector, to promote environmentally sound practices.	The Institute of Waste Management South Africa offers various accredited and non-accredited training programs nationally to build capabilities within the waste management sector, including within hazardous waste management.[2]
		• **Thought Leadership and Academic Research**	1. Collaborate with the universities and institutes to provide grants or set up research programs focusing on those gaps in the technologies or capabilities identified in the country. 2. Ensure results from academic research are shared to increase awareness and enable stakeholders to make informed decisions on investments and policies needed.	The National Center for Electronics Recycling (NCER) conducts research on e-waste management, publishing industry data, best practices, and policy recommendations for industry stakeholders, government bodies, and researchers.[3]
		Capacity building		
		• **Establish Dedicated Capacity Within Government Bodies**	1. Benchmark other countries' governance structure on e-waste management (who is the ministry responsible, what does the regulator, are there specialized bodies or committees to tackle e-waste, etc.) Map the current government bodies and their capacity, consulting with the different representatives on the roles of the agencies. 2. Identify those roles and responsibilities that need to stay within the governmental bodies (central government vs municipalities), while agree on the capacity and role of the private sector across the value chain (e.g., Producer Responsibility Organizations to support the enforcement of EPR).	Oman Environmental Services Holding Company (be'ah) is a government owned company that is responsible for managing waste (including e-waste) in the country, providing waste management services from collection to disposal to both private and public sectors.[4]
		• **Outsource Capacity To The Private Sector**		Finland's Producer Responsibility Organizations (PROs) are responsible for managing the collection, recycling, and disposal of electronic waste, ensuring manufacturers fulfill their obligations to minimize environmental impact.[5]

1. Suame Municipal Assembly, a 5-Day Training Workshop on Electronic Waste (E-Waste) Management - Suame Municipal Assembly
2. The Institute of Waste Management
3. The National Center for Electronics Recycling (NCER), About NCER - Electronics Recycling
4. Oman Environmental Services Holding Company, Home – Beah
5. Producer Organisations, Elker, SELT association – Elker

Human Capital And Awareness – Examples Of Best Practices (2/2)

Human Capital and Awareness

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Human Capital and Awareness	Awareness	**Communication, Information, and Awareness Initiatives**		
		• **Public Service Announcements, Awareness, and Behavioral Change Campaigns**	1. Identify the topics requiring more attention in terms of awareness, as also the target audience (consumers, industries businesses, e-waste recycling companies, etc.) and most suitable channels (media, website, etc.). 2. Potentially collaborate with NGOs or international organizations to reinforce the message and impact of the campaign. 3. Design and launch content, while monitoring the impact through the definition and tracking of certain KPIs (# of clicks, #visits, etc.).	The PolyCE project, funded by the European Commission with UN support, is an awareness campaign encouraging consumers to choose electronics made with recycled plastics, while guiding manufacturers to integrate recycled components for environmental sustainability.[1]
		• **Resources on Government Websites**		The United States Environmental Protection Agency provides resources on responsible e-waste management practices for consumers and e-waste management actors on their website.[2]
		Community Engagement		
		• **Visible E-Waste Initiatives**	1. Set up a process to collect information (e.g., create a basic template with the key information required) on e-waste initiatives run both by the government and by other stakeholders. 2. Ensure that content is published and up-to-date, with available channels for commenting and engaging with the public and the companies.	Cambridge City Council in the UK provides bright pink bins to collect residents' e-waste and reported nine times more e-waste being collected after their installation.[3]
		• **Community Workshops and Events**	1. Evaluate the organization of workshops and events to reach a specific target audience (youth, organization of companies, etc.) and raise awareness on a defined topic (e-waste impact, safe procedures for recycling e- waste). 2. Define a schedule of events and workshops at the beginning of the year, booking in advance locations and securing key stakeholders' availability. 3. Deliver the events/workshops (potentially in collaboration with other companies and municipalities) and collect the feedback from participants.	The Ecotic Caravan, an educational initiative co-funded by LIFE+, used a mobile WEEE exhibition to raise awareness on e-waste management across Romania, engaging the public and school children through hands-on workshops and interactive displays of dismantled electronics.[4]
		Educational Programs	1. Collaborate with universities and educational institutions to design courses or classes/modules where e-waste and its impact is explained. 2. Potentially sponsor the creation of these curricula. 3. Ensure there is a communication campaign targeted to the audience of the program to increase attendance. 4. Monitor participants' satisfaction.	Taiwan's educational curriculum includes modules on environmental stewardship, where students learn about the environmental impact of e-waste, the importance of recycling, and practical tips for reducing their ecological footprint.[5]

1. The PolyCE Project, Polyce-project
2. Sustainable Management of Electronics | US EPA
3. E-Waste: 5 ways to boost e-recycling and why it matters | World Economic Forum, 2024
4. The Ecotic Caravan - WEEE collection and awareness campaigns | European Circular Economy Stakeholder Platform, 2016
5. Taiwan's E-Waste Management: A Model for Global Sustainability Amidst Geopolitical Challenges – PIVOT, 2024

Infrastructure and Technology - Infrastructure and Equipment Mechanisms

Infrastructure and Technology - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability									
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export
Infrastructure and Technology	Infrastructure and Equipment	• **E-waste Collection Infrastructure**	Drop-off locations at retail stores, municipal centers, or kiosks for secure, easy e-waste disposal, and more articulated collection systems for both consumers and businesses.	• Offers simple disposal, encouraging public participation and reducing data privacy concerns. • Facilitate e-waste collection also from businesses.				X						
		• **Storage Infrastructure**	Storage for sensitive components to prevent leakage, degradation and theft.	• Secures e-waste, minimizing risks while awaiting further processing.				X						
		• **Specialized Transport Vehicles**	Vehicles designed to safely transport e-waste, with secure containers, climate control, and spill kits for e-waste.	• Secures items during transit, maintaining potential for repair and reducing the risk of damage or spills.					X					
		• **Data Wiping Infrastructure**	Facilities for secure data erasure, to ensure private and sensitive data are properly managed, a concern for both consumers and businesses, as well as governmental organizations.	• Ensures data security for data-containing devices.				X						
		• **Dismantling Machinery**	Machinery to disassemble electronics for sorting and further processing. Some Dismantling might need to be manual due to the complexity of the electronics or the trade-off between cost of the machinery and cost of labor.	• Enhances recovery of valuable components, supporting recycling • Automates processes to increase efficiency and safety.							X			
		• **Sorting Technologies And Infrastructure**	Advanced sorting tools for material separation, including magnetic and density-based systems.	• Improves material purity, supporting efficient recycling processes.				X						
		• **Recycling/Processing Technologies And Infrastructure**	Technologies to recover materials from e-waste, including separators, mechanical recycling, chemical recycling, and shredders, enabling efficient recovery of reusable components.	• Increases material recovery and efficiency of processing. • Improves material purity. • Maximizes value from waste before considering the landfill.								X		
		• **Infrastructure For Neutralizing Hazardous Waste**	Facilities to treat toxic e-waste byproducts and components (i.e. batteries) safely and dispose them.	• Prevents soil and water contamination and reduces risks to the environment and human health.								X	X	
		• **Disposal Infrastructure**	Proper disposal infrastructure for safely managing non-recyclable e-waste, including landfills and waste-to-energy facilities for non-recyclable e-waste.	• Enables safe disposal of residual waste.										X

Infrastructure And Technology - ICT And Digital Tools Mechanisms

Infrastructure and Technology - Mechanisms

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Description	Potential Impact	Value Chain Applicability										
					Import	Production	Consumption	Collection	Transport	Reuse	Disassembly	Recycling	Final Disposal	Export	
Infrastructure and Technology	ICT and Digital Tools	• **Centralized Data Management Software**	Centralized software platforms manage data on e-waste import/export, collection, processing, and recycling, consolidating data from multiple sources.	• Improves transparency and enhances reporting and evaluation processes.	X	X	X	X	X	X	X	X	X	X	
		• **E-waste Tracking Technologies**	Technologies for tracking of e-waste, beginning either at the manufacture of electronics, or collection of e-waste to final disposal (leveraging the product passport or the mandatory labels that electronics need to have in place. Governments or companies can leverage IoT and blockchain to monitor the movement and lifecycle of e-waste from generation to disposal, thus enhancing traceability and transparency of the e-waste value chain – *See Regulation, Policy & Strategy*).	• Increases traceability, prevents illegal dumping, and supports efficient material recovery.	X	X	X	X	X	X	X	X	X	X	
		• **GIS Tools For Spatial Analysis And Planning**	Geographic Information System (GIS) tools help analyze and map e-waste generation, collection and processing sites for better resource planning.	• Enables better planning of e-waste facilities and resource allocation.			X	X	X		X	X	X		
		• **Ai-powered Technology For Sorting And Data Collection**	Artificial Intelligence (AI) powered systems enable automated sorting of e-waste into fractions/components and tracking of inputs and outputs at facilities.	• Improves efficiency and reduces human error in e-waste sorting and data collection.							X	X			
		• **Import/Export Compliance Platform**	Software that facilitates administration and compliance with import/export regulations for e-waste, including adherence to international standards.	• Supports legal trade practices and strengthens international collaboration.	X									X	
		• **Marketplace Platforms For E-waste B2B Trade And Exchange**	Digital platforms to facilitate the sale and exchange of used electronics or e-waste materials, supporting businesses to tackle the recurrent issue of insufficient feedstock.	• Encourages reuse and recycling, reduces waste generation, and supports circular economy practices. • Fosters business relationships and collaboration.				X		X					
		• **Platforms For E-waste Consumers**	Apps and websites to inform consumers about nearby collection points and e-waste drop-off events and also incentivize the flow of second-hand/repaired electronics. These digital online platforms can also connect consumers with recyclers and refurbish companies for seamless e-waste transactions.	• Increases consumer participation in recycling efforts, making collection more accessible. • Bridges the digital divide.				X							

Infrastructure And Technology – Examples Of Best Practices (1/2).

Infrastructure and Technology

Facilitates International Cooperation

Non-Exhaustive

		Mechanism	Actions	Example
Infrastructure and Technology	Infrastructure and Equipment	• **E-Waste Collection Infrastructure**	1. Map the e-waste generation, collection and storage across the countries, 2. Compare the volume and type of e-waste generated vs. collected vs. processed across the territory and identify gaps or bottleneck. 3. Engage with the municipalities and private companies to discuss the findings and how the gaps can be addressed (who will create more collection point, what investment is required for additional storage infrastructure, etc.).	• In New York City, the 'ecycleNYC' program offers secure collection bins or pick-up services for residential buildings with ten or more units.[1]
		• **Storage Infrastructure**		• E-Waste storage infrastructure is typically required to be secure, climate-controlled to prevent degradation of materials, organized for efficient sorting, and equipped with containment measures to prevent leakage of hazardous substances.
		• **Specialized Transport Vehicles**	1. Assess the status of the current assets (vehicles, data wiping infra, dismantling machinery, etc.) across the value chain, collecting input from the public and private stakeholders (what they have, what is the plan for the next 5 years, what is the need that they see in the market, etc.). 2. Identify gaps either in terms of capacity (e.g., need to increase the number of vehicles) or technologies (current data wiping and dismantling technologies are outdated), based on the market demand. 3. Design an implementation plan (provide financial help to private companies) and get approval of the business case. 4. Launch implementation and monitor results to confirm impact.	• Transport vehicles for e-waste should be robust, equipped with containment features to prevent spills or leaks of hazardous materials, climate-controlled to reduce damage during transit.
		• **Data Wiping Infrastructure**		• Data wiping infrastructure erases data through methods like overwriting (replacing data with random characters) using specialized software, ensuring complete data removal for privacy and security compliance. NIST SP800-88 provides international best practice requirements for data destruction.[2]
		• **Dismantling Machinery**		• Globally, e-waste processing facilities (such as Oman's Evergreen Gulf Recycling Hub) use dismantling and sorting techniques to optimize material recovery. After initial dismantling to separate reusable parts, scrap e-waste is often shredded for sorting.[3]
		• **Sorting Technologies and Infrastructure**	1. Conduct an analysis to understand the current state of sorting and recycling technologies across the country, collaborating with private companies and municipalities. 2. Collaborate with universities and NGOs to understand the latest trends, pros and cons of new and current technologies. 3. Map the market needs in terms of type of sorting and recycling required (e.g., lack of plastic recycling, low capacity of batteries recycling, etc.). 4. Identify the gaps between demand and current capabilities and define key initiatives that could help enhance capacity and innovation of the sorting and recycling processes. 5. Collaborate with the private sector to implement initiatives, considering PPPs to finance it and ensuring solid business case behind investment.	• Magnetic separation is typically used to target ferrous metals, while eddy current separation isolates non-ferrous metals and non-metals.[3]
		• **Recycling/Processing Technologies and Infrastructure**		• E-Waste recycling targets materials like precious and base metals, plastics, glass, and various batteries, each needing distinct recovery methods[3] – Various metallurgical techniques—hydrometallurgy, biometallurgy, pyrometallurgy, and combined methods—are commonly employed to recover metals from e-waste. – Typically, plastic recycling involves collecting, sorting, washing, shredding, separating, and melting plastics into pellets for reuse in new products.[4] – Glass recycling involves collecting, cleaning, crushing, and melting glass waste to form new products. – Lithium-ion batteries are recycled by discharging, shredding, and separating valuable metals like lithium and cobalt using chemical or heat-based methods, while lead-acid batteries are crushed to separate lead and plastic, with lead smelted for reuse and acid neutralized or repurposed.
		• **Infrastructure for Neutralizing Hazardous Waste**	1. Identify the type of waste and volume that reach the latest stages of the value chain, the current challenges and opportunities, the collaborations to tackle the final disposal of waste, and to increase circularity efforts. 2. Collaborate with the private sector, municipalities and NGOs to raise awareness on the need for better circularity strategies.	• Neutralizing hazardous waste requires facilities for safely handling toxic substances like mercury, lead, cadmium, and flame retardants, and capturing gases like CFCs from refrigeration units.
		• **Disposal Infrastructure**		• Disposal infrastructure includes secure landfills and waste-to-energy facilities, designed to handle residual, non-recyclable e-waste components while minimizing environmental impact.

1. ecycleNYC – DSNY, NYC Department of Sanitation
2. SP 800-88 Rev. 1, Guidelines for Media Sanitization | CSRC
3. Current recycling innovations to utilize e-waste in sustainable green metal manufacturing | Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences
4. Step by Step Process of Recycling Plastic | Greentumble

Infrastructure And Technology – Examples Of Best Practices (2/2).

Infrastructure and Technology

Facilitates International Cooperation

Non-Exhaustive

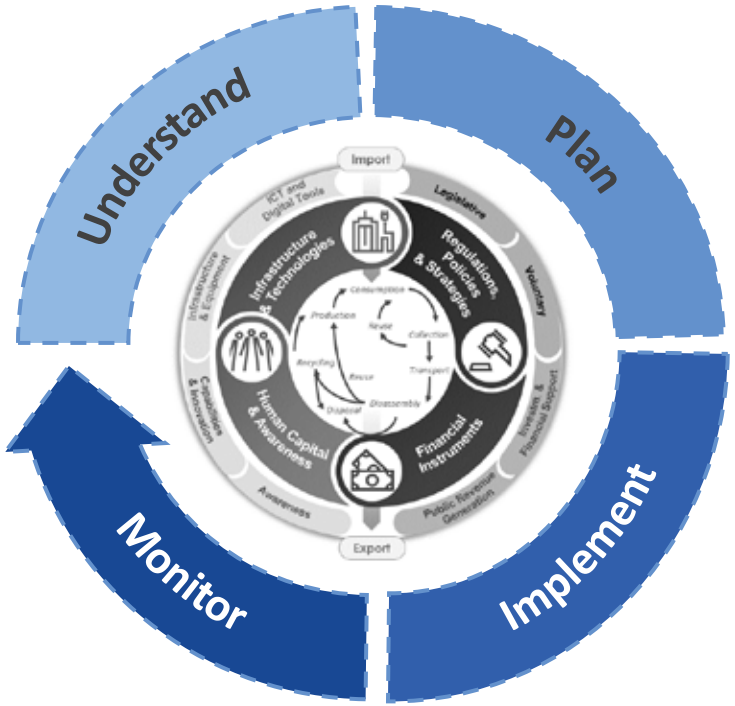
		Mechanism	Actions	Example
Infrastructure and Technology	ICT and Digital Tools	• **Centralized Data Management Software**	1. Define the KPIs to be measured and reported across the value chain, along with the frequency of the reporting (e.g., annual vs monthly metrics, etc.). 2. Identify the stakeholders that need to measure them and prepare guidelines on what to measure and when. 3. Set up a platform where companies and stakeholders can submit the reports, potentially linking them with licensing to operate.	• Ghana's Environmental Protection Agency (EPA) is required to maintain a centralized database with input from stakeholders to track producer market share, recording permits, WEEE tonnage, market entries, and compliance status.[1] • BeWeee is a Belgian web application that helps companies comply with European reporting requirements for EEE and WEEE by facilitating submission of data on EEE sales, WEEE collection, and processing, supporting Belgium's regulatory compliance and e-waste tracking.[2]
		• **E-Waste Tracking Technologies**	1. Evaluate the latest technologies to track e-waste across the value chain (e.g. blockchain, labels, and tracking system, etc.). 2. Design The integration of the technology in the processes across the value chain, consulting with the different stakeholders and addressing operational challenges and reducing the burden on the actors. 3. Finance the implementation of the technology and monitor results.	• Blockchain technology for waste tracking was used by the Dutch government to streamline the management of waste transportation, ensuring real-time tracking and regulatory compliance, with potential to be expanded to e-waste.[3]
		• **GIS Tools for Spatial Analysis and Planning**	1. Evaluate feasibility, costs and benefits for the application of the technology, in consultation with the different actors of the value chain. 2. If agreed to implement, finance the design and launch of the technology through partnership with tech and ICT solution providers.	• SGL's IGiS platform has the potential to enhances smart e-waste management by using GIS technology for optimized route planning, real-time vehicle tracking, and predictive analysis, improving operational efficiency and reducing environmental impact.[4]
		• **AI-Powered Technology for Sorting and Data Collection**		• Greyparrot uses AI computer vision systems deployed in sorting facilities around the world to monitor, analyze and sort large waste flows at scale.[5]
		• **Import/Export Compliance Platform**	1. Evaluate the launch of a platform to track e-waste (or waste?) export, defining the input (company license, volume trade, etc.) and output (trade's approval, certification of compliance, etc.) requirements. 2. Discuss the feasibility, cost and benefit analysis with impacted (public and private) stakeholders, including potential challenges and risk of the implementation. 3. Partner with ICT solution providers to launch the platform, setting up also the support services to tackle any queries and issues from the users. 4. Launch a communications campaign to inform the stakeholders of this new process and tool, and raising awareness on the benefits it would bring. 5. Monitor results and adjust the platform based on feedback.	• Dubai's Environmental Compliance Platform supports exporting of e-waste by streamlining the associated administrative processes by reducing documentation cycles, eliminating paper-based procedures, and minimizing administrative time.[6]
		• **Marketplace Platforms for E-Waste B2B Trade and Exchange**		• RCRAInfo WIETS is an electronic system by the EPA for processing hazardous waste export and import notices, accessible through the Central Data Exchange (CDX), enhancing efficiency and compliance tracking.[7] The e-Manifest System also managed by the EPA, allows for electronic tracking of hazardous waste shipments, integrating export manifests directly into the system to streamline processes.[8]
		• **Platforms for E-Waste Consumers**		• Egypt's E-Tadweer app is a green market application to create a win-win situation for consumers, retailers and recyclers, and provides discount vouchers to consumers who recycle their e-waste.[9] • The Finnish Producer Responsibility Organization Kierratys provides an online interactive map for consumers to identify nearby collection points for different waste types.[10]

1. Sustainable Recycling Industries, International e-Waste Management Practice Country Factsheets, 2021, e-Waste_Management_Practice_Country-Factsheets_Final.pdf
2. BeWeee, BeWeee - brengt e-waste stromen in kaart
3. Netherlands to harness blockchain for waste management operations, 2018, Netherlands to harness blockchain for waste management operations | Computer Weekly
4. Smart Waste Management Solutions with GIS Technology (IGiS), SGL, 2024
5. GreyParrot, https://www.greyparrot.ai/
6. Dubai Municipality launches electronic platform for exchange of recyclable or reusable materials, Dubai Municipality, 2021
7. Information for exporters of Resource Conservation and Recovery Act (RCRA) Hazardous Waste | US EPA
8. Federal Register :: Integrating e-Manifest With Hazardous Waste Exports and Other Manifest-Related Reports, PCB Manifest Amendments, and Technical Corrections, 2024
9. E-Waste: 5 ways to boost e-recycling and why it matters | World Economic Forum, 2024
10. Kierratys, Kierratys.info | Kierratys.info

To Use The Framework, A Four-step Approach is Recommended To Ensure Effectiveness In Stepping Up Efforts To Manage E-Waste And Guiding Change In Diverse Contexts.

E-Waste Management Framework: Application Guide

Illustrative



1 UNDERSTAND

- Develop a Clear Picture of the Current State of the National E-Waste Management Value Chain and Wider Ecosystem and Set up Systems for Continued Monitoring.

2 PLAN

- Define Desired Outcomes and Identify Key Subcomponents (and Subsequent Mechanisms) to Create Change.

3 IMPLEMENT

- Implement Initiatives Linked To Subcomponents Identified In The Planning Stage Through Communication, Execution, And Enforcement.

4 MONITOR

- Collect data To Enable Continuous Assessment Of Initiatives' Impact And Approach Refinement.

Step 1 Focuses On Developing a Comprehensive Understanding Of The Current State Of The E-Waste Management Landscape, Including Stakeholders, E-Waste Flows, And Key Subcomponents.

E-Waste Management Framework: Step 1 - Understand

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

1A Value Chain Mapping

- **Assess the current state of the e-waste value chain, identifying key stakeholders, interactions, and e-waste flows.**
  - **Map Stakeholders** (Public Sector, Private Companies, Social And Informal Sector, etc.) Involved in each stage of the value chain, and Identify Roles, Mandates, Activities, Characteristics and Interactions. The Informal Sector is crucial, especially in developing countries to effectively promote and implement circular strategies beyond recycling.
  - **Identify E-Waste Flows** throughout the value chain, including quantities and sources of import, generation, collection, and recycling, ideally segmenting the e-waste flow by type of e-waste category (e.g., Small electronics).

1B Ecosystem Assessment

- **Evaluate The Current State Of Subcomponents In The E-Waste Management Ecosystem.**
  - Regulation, policies, and strategies at National level and at International level, either e-waste specific or related to waste/hazardous waste in general.
  - Financial Instruments such as tariffs and investment schemes to support e-waste management across the value chain.
  - Infrastructure and equipment for each step of the value chain, to derive the current capacity (volume and type) for e-waste management.
  - Human Capital and Awareness, from e-waste training to awareness campaigns.

Stakeholders In Each Stage Of The Value Chain Should Be Identified, Providing A Clear View Of Existing Activities And Interactions To Guide The Development Of An Action Plan.

E-Waste Management Framework: Step 1 - Understand

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

1A Value Chain Mapping

Map Stakeholders | Identify E-Waste Flows

- **WHO: Identify The Stakeholders Involved In Each Stage Of The Value Chain**, across the private, public, social, and informal sectors and map them across the value chain. Identify all those who will be affected by regulations and who can drive efforts across the e-waste value chain.
  - **Example:** EEE producers (including manufacturers, importers, distributors and retailers), e-waste collection services, e-waste recyclers, municipalities, NGOs active in this space, etc.
  - Activate stakeholders by interviewing them, validating the information collected, and onboarding them to take an active role in the e-waste management scale up.
- **WHAT: Map Their Roles, Mandates, Activities, Characteristics And Interactions**
  - Identify existing or future roles and mandates within the value chain.
  - Map the location and scope of their activities/nature of the business and organization.
  - Identify interactions that can be leveraged or shifted.
  - Collect their points of view on current challenges and opportunities.
- **HOW: Go Step By Step Across The Value Chain, And Engage Extensively With Stakeholders, Identifying Their Underlying Motivation To Join This E-Waste Management Effort.**
  - The stakeholder mapping process should be as comprehensive as possible.
  - Data might be limited; this can be a great start to consolidate information across the value chain.
  - Without comprehensive value chain mapping, it is difficult to design the implementation roadmap.

E-Waste Flows Across The Value Chain Should Be Identified And Measured, Establishing Baseline Metrics To Track Progress And Inform Future Priorities.

E-Waste Management Framework: Step 1 - Understand

Non-Exhaustive

1 UNDERSTAND
2 PLAN
3 IMPLEMENT
4 MONITOR

1A Value Chain Mapping

Map Stakeholders | Identify E-Waste Flows

- **WHAT: Identify E-Waste Flows And Establish Key Metrics To Measure Flows Throughout The Value Chain.**
  - Collect both qualitative and quantitative data, mapping the volume and characteristics of the e-waste across the stages of the value chain.
  - Establish baselines of the current flow to have the ability to monitor changes and progress in the future years and to identify current priorities – It is recommended to map flows for each e-waste category, as the value chain might vary significantly between legacy and new electronic and electrical products.
  - Support the development of realistic targets and communicate them to the main stakeholders, understanding how to enforce them (e.g., do not only set recycling targets but also reuse and repair ones).
  - Allow key issues and challenges behind the lack of data or low collection/recycling rates, to make informed decisions later. Leverage technologies to enhance data collection and tracking.
  - **Example**: EEE placed on market, e-waste generated by the private sectors, e-waste generated by the consumers, e-waste imported, e-waste formally collected, e-waste formally recycled, etc.
- **HOW: Set Up Systems To Enable Continuous Data Collection For Monitoring And Evaluation.**
  - Set up digital tools and processes to collect current and future data related to e-waste management.
  - Ensure stakeholders are accountable for tracking information and updates.
  - Leverage the value chain steps and map the volume across the different stages, to identify bottlenecks and key hotspots to be prioritized.

The Current E-Waste Management Ecosystem Should Be Systematically Assessed, Identifying Key Mechanisms, Barriers, And Gaps Across Components.

E-Waste Management Framework: Step 1 - Understand

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

1B Ecosystem Assessment

- **WHAT: Assess The Current State Of The E-Waste Value Chain, By Identifying Mechanisms & Barriers.**
  Identify The Current State of the country's e-waste management system across the four mechanism subcomponents: Regulations, Policies and Strategies, Financial Instruments, Human Capital And Awareness, and Infrastructure & Technologies.
  - Perform a systematic review of existing regulation, policies, and strategies governing e-waste to provide a clear picture of regulatory strengths and gaps – differentiate between legacy vs. new EEE, as regulations for the legacy products might remain unchanged, while updated laws may be required for new products.
  - Assess the financial instruments currently available and identify potential financial barriers that could impact investment and participation in e-waste management.
  - Assess public awareness and workforce capabilities related to e-waste management, including evaluating existing educational programs, industry certifications, and awareness campaigns.
  - Assess the availability and condition of infrastructure and technologies for e-waste management.
- **HOW: Connect With Stakeholders Across The Value Chain.**
  - Organize consultations and workshops to gather input from stakeholders across sectors.
  - Deploy standardized surveys through government channels to reach a broad audience, including businesses, regional authorities, and the civil society.
  - Integrate data from all sources to create a comprehensive assessment of the e-waste management system.

Step 2 Focuses On Planning By Defining Desired Outcomes, Identifying Priority Areas For Intervention, And Developing A Detailed Action Plan To Guide Interventions.

E-Waste Management Framework: Step 2 - Plan

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

2A Define Desired Outcomes And Prioritize Areas For Intervention.

- **Define The North Star Goals And Outcomes, Across Each Step Of The Value Chain** (from import to export) **and each subcomponent** (from regulations to awareness).
- **Conduct A Gap Analysis** comparing the North Star with the current state assessment, and identify key areas and priorities of intervention.
- **Leverage the E-Waste Management Framework** to identify actions across the e-waste management framework.

2B Develop An Action Plan.

- **Identify Ideal Stakeholder Roles, Responsibilities And Interactions** throughout the value chain for the prioritized areas, obtaining their feedback and ensuring their input is integrated and their buy-in secured.
- **Develop An Action Plan, With Both Short-term And Long-term Initiatives,** detailing the objectives, quantitative targets, actions, stakeholders and accountable, funds and resources required for each initiative.

Step 3 Supports The Implementation Of Sustainable And Effective Change By Communicating With Stakeholders And Executing Initiatives.

E-Waste Management Framework: Step 3 – Implement

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

3A Communicate

- **Communicate Objectives And Roles To All Stakeholders.**
  - **Communicate The New Implementation Plan To The Relevant Stakeholders,** ensuring transparency and engagement.
  - **Set Up Governance Structures To Involve Relevant Stakeholders,** outlining expectations and responsibilities.

3B Execute

- **Execute initiatives.**
  - **Mobilize Key Stakeholders** and **Foster Ongoing Dialogue And Working Groups** among stakeholders to address concerns, provide updates, and reinforce collaborative efforts.
  - **Set Up Required Administrative Systems** to enable smooth execution and ensure that the necessary resources are in place.
  - **Execute Initiatives Across The Subcomponents And Steps Of The Value Chain** (e.g., design regulations, publish strategies, launch pilot projects in key areas, etc.).

Step 4 Focuses On Monitoring The Effectiveness of Interventions And Progress Made Through Analysis Of Key Metrics And Stakeholder Perspectives.

E-Waste Management Framework: Step 4 - Evaluate

Non-Exhaustive

1 UNDERSTAND

2 PLAN

3 IMPLEMENT

4 MONITOR

4A Monitor Progress And Outcomes

- **Monitor Progress** through both quantitative tracking mechanisms (collect data from different stakeholders and initiatives in a central system) and qualitative feedback loop (interview stakeholders and launch recurrent analysis across the value chain).
- **Track Progress Against The Objectives And Targets** set in the action plan, using clear metrics to assess the effectiveness of initiatives – Leverage technologies and ICT tools to enhance data tracking by launching platforms and initiatives that ensure high-quality data and visibility across the entire e-waste value chain.

In The Third Step, The E-Waste Management Framework Was Developed Based On Insights From Existing Frameworks And Findings From Benchmarking And Current State Assessments.

Process for E-Waste Management Framework Development

Illustrative

1

Define The Fundamentals Of The E-Waste Management Framework.

2

Benchmark Best Practices And Existing Frameworks.

3

Design The E-Waste Management Framework.

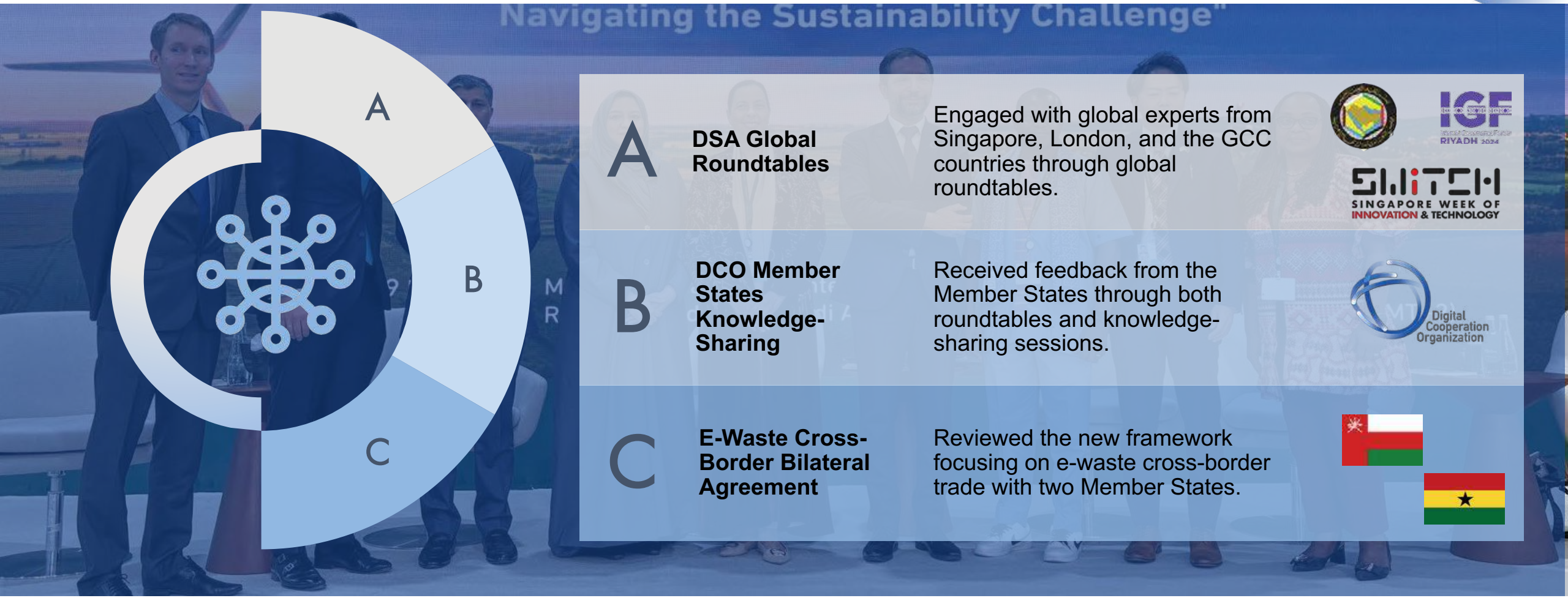
4

Refine The Framework Using Global Roundtables And A Review With DCO Member States.

We Tested The New "E-Cycle In Action For Governments" Framework With The DCO Member States And Global Experts Through Four Roundtables And Member States review.

Activities To Test And Apply The New DCO E-Waste Framework

Illustrative

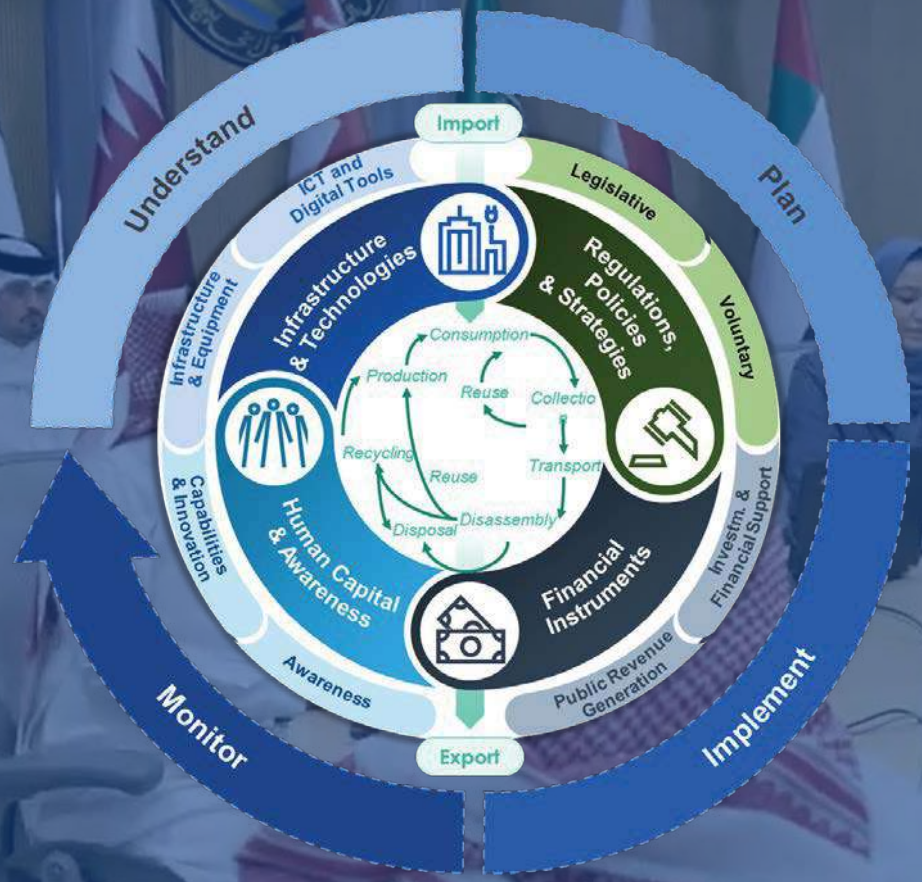


A	**DSA Global Roundtables**	Engaged with global experts from Singapore, London, and the GCC countries through global roundtables.
B	**DCO Member States Knowledge-Sharing**	Received feedback from the Member States through both roundtables and knowledge-sharing sessions.
C	**E-Waste Cross-Border Bilateral Agreement**	Reviewed the new framework focusing on e-waste cross-border trade with two Member States.

Experts And DCO Member States Highlighted The Importance Of Having A Common Definition Of E-Waste, Enforcing The Mechanisms, And Linking E-Waste To Critical Raw Materials.

Feedback on the Framework Overall

Illustrative



1

E-Waste Definition

It is crucial to align the definition of e-waste, the first step to understanding the issue and the framework itself for a solid e-waste management system.

2

Enforcement

Regulations are not effective if not enforced. Governments need to design e-waste governance and laws; enforcement is crucial for achieving the desired impact.

3

Critical Raw Materials

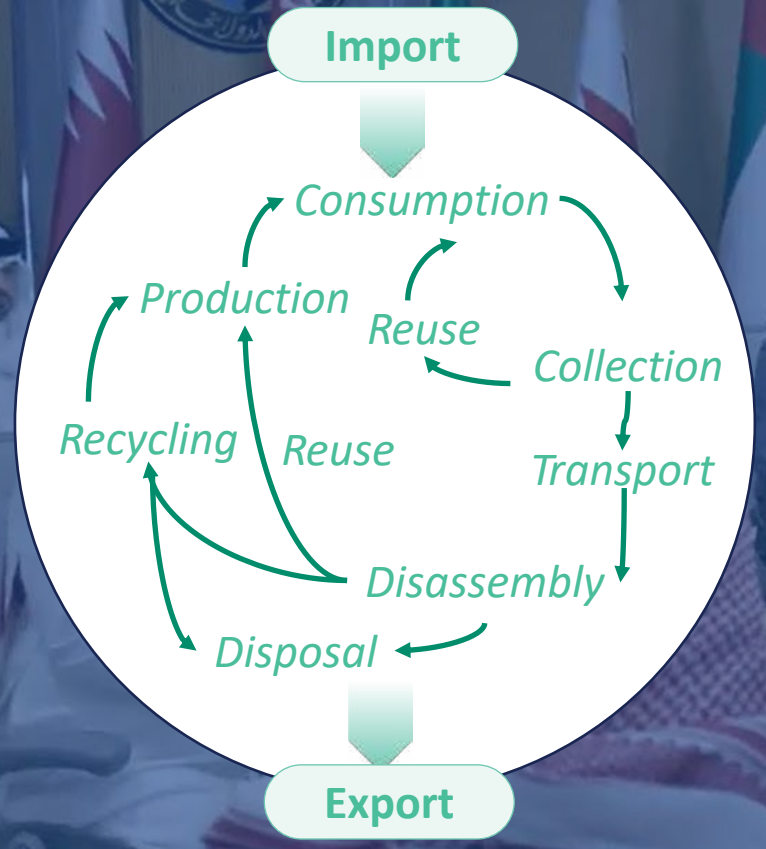
E-Waste should also be linked to Critical Raw Materials, as this can be a further driver from an economic development point of view.

This topic includes sectors beyond e-waste and focuses primarily on recycling rather than on reusing and repairing

It Clearly Emerged That The E-Waste Value Chain Is Complex And Needs To Be Mapped For Different E-Waste Categories, Focusing First On Repair And Reuse And Enhanced Through Cross-Border EPR Mechanisms.

Feedback on the First Component of the Framework

Illustrative



4 Complex E-Waste Value Chain

The value chain of e-waste varies significantly across both countries and e-waste categories: govt's need to carefully map the value chain by e-waste category.

5 Circular Strategies Beyond Recycling

While e-waste is normally associated with recycling, it is crucial to align targets and government mechanisms to also promote repair and reuse.

6 Import/Export of E-Waste and EPR

Cross-border e-waste flow is becoming more difficult due to recent conventions and laws. Countries must also agree on how to apply EPR beyond borders.

Regulations Need To Be Up-To-Date With The New EEE Products, While Technology Is A Fundamental Ally For Tracking And Efficiency, Helping Understand The Financials And Profitability Of The E-Waste Value Chain.

Feedback on the Second Component of the Framework

Illustrative

7 Legacy vs New EEE Regulations

Regulations need to differentiate between legacy EEE products (e.g., fridge) versus new ones (e.g., vapes) and update the laws accordingly.

8 Tech and Tools for Tracking and Efficiency

Technologies such as AI, IoT, and Blockchain need to be leveraged by the e-waste management system to track data and increase efficiency.

9 Financials and Profitability

Governments have a poor understanding of costs and margins across the e-waste value chain. It is crucial to set up incentives to prioritize repair first, and then recycling.

Finally, Stakeholder Mapping Is A Success Factor For Implementation, As Is The Signature Of Cross-Border E-Waste Bilateral Agreements, Along With The Engagement Of The Informal Sector And Access To Quality Data.

Feedback on the Third Component of the Framework

Illustrative

10 **Stakeholder Mapping & Governance**
It is important to identify ministries and authorities involved in the e-waste management: coordinated efforts are crucial to successfully sign bilateral agreements and regulations.

11 **Informal Sector**
Governments need to engage the informal sector, which plays a critical role in local communities and circular strategies especially in developing countries.

12 **Quality of Data**
Without good data, it is not possible to plan and implement effectively: in the first step, governments need to double down on data collection and quality.

5. Appendix
Existing Frameworks

Digital Cooperation Organization

For Each Framework, We Assessed Alignment With Design Principles, Audience, Geography, And Core Characteristics To Pinpoint Gaps And Generate Ideas For The New Framework.

Template to Analyze Existing Frameworks

Example

TITLE

Sources

Archetype: **e.g.,** Value Chain + Mechanisms + ….

Design Principles:

Target: e.g., Public Sector

Geography: e.g., Global, Africa

Framework Overview:

High-level summary of the framework's components

Key Characteristics

The Stocks And Flows Model Describes The E-Waste Life Cycle And Defines Multiple Possible Scenarios For EEE Use, E-Waste Collection, And End-of-life Processing.

E-Waste Specific Frameworks: Stocks and Flows Model

Illustrative, Non-Exhaustive

Stock and Flows of E-Waste

Policy Practices in E-Waste Management

Archetype: Value Chain

Design Principles:

Target: Public Sector

Geography: Africa

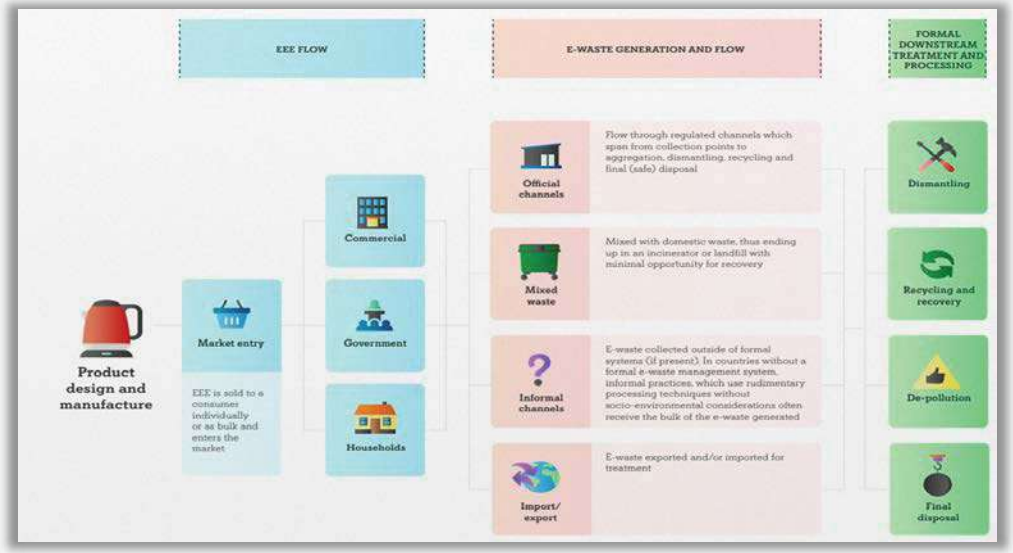
Framework Overview:

The E-Waste Stocks and Flows Model defines the e-waste management value chain, from manufacture to end-of-life.

- **Value Chain Steps:**
  - EEE flow (market entry and use).
  - E-Waste generation and flow (collection and movement).
  - Downstream treatment and processing (e.g. dismantling, recycling & recovery, de-pollution, and disposal).

Key Characteristics

Recognizes the diversity of EEE users, which may result in different disposal methods.	Recognizes incorrect disposal, the use of informal channels and import/export.	Does not identify trends or likely outcomes for downstream processing based on different collection methods.



Source : ITU

The Toolkit For Policy Practices In E-Waste Management Provides Multiple Considerations And Structures For Understanding And Implementing EPR In Africa.

E-Waste Specific Frameworks: Toolkit for Policy Practices in E-Waste Management

Illustrative, Non-Exhaustive

Toolkit for Policy Practices in E-Waste Management

Archetype: Mechanisms x Process x Policy Instruments

Design Principles:

Target: Public Sector

Geography: Africa

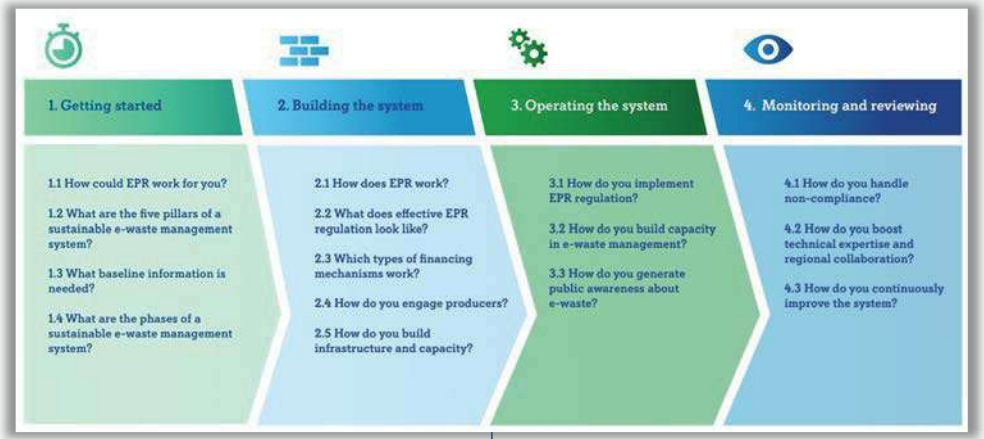
Framework Overview:

The Toolkit identifies a linear process for establishing EPR, guided by key focus areas, mechanisms and steps for successful implementation.

- **4-step process for establishing and sustaining EPR**, supported by:
  - **4 Steps For Successful Implementation** (Planning, Implementation, Monitoring, And Review).
  - **5 Principal Areas/Levers** (Business And Finance, Policy And Regulation, Technology And Skills, Monitoring And Control, Marketing And Awareness).
  - **8 Policy Instruments Areas.**

Key Characteristics

Focused on both components (levers and mechanisms) and process, but in a disjointed manner.	Provides broad, country-agnostic principles, considerations and best practices.	Focused specifically on implementation of a specific policy, Extended Reducer Responsibility.



Implementation Steps

Principal Areas

Policy Instruments

Source : ITU

The Global Transboundary E-Waste Flows Report Describes The High-level Value Chain Of E-Waste, Including Transboundary Flows.

E-Waste Specific Frameworks: Global Transboundary Flows

Illustrative, Non-Exhaustive

Global Transboundary E-Waste Flows

unitar
United Nations Institute for Training and Research

Archetype: Value Chain

Design Principles:

Target: Public and Social Sector

Geography: Global

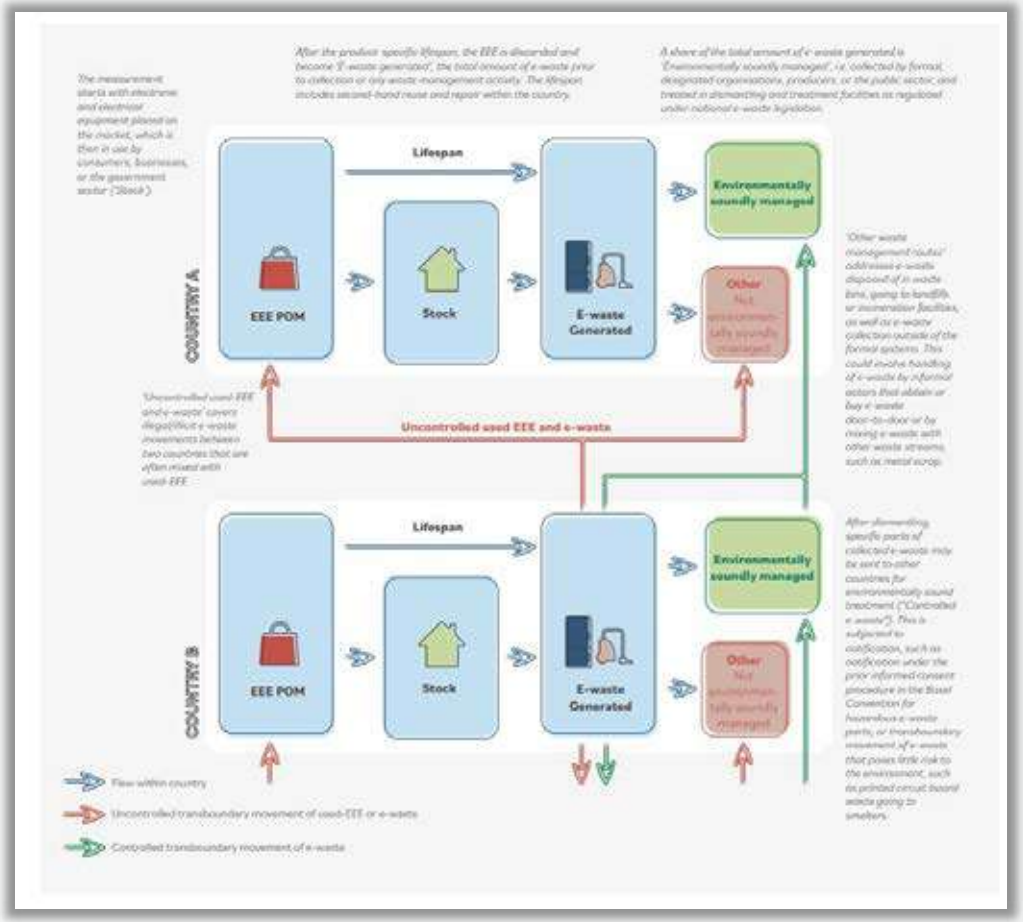
Framework Overview:

This framework describes the movements of EEE and e-waste that result in its environmentally sound, or unsound, management.

- **Value Chain Steps:**
  - EEE Placed On Market (POM).
  - Lifespan Of EEE (including Stock).
  - E-Waste Generated.
  - Domestic Processing Or Transboundary Movement Of E-Waste For Management (Either Sustainably, Or Unsustainably).

Key Characteristics

Acknowledges both controlled and uncontrolled cross-border e-waste flows.	Distinguishes between environmentally sound and unsound management practices.	Describes not only the flow of e-waste but also of used-EEE to low-income countries for extended use.



Source: UNITAR

The Life Cycle Framework For E-Waste Management Maps Levers And Mechanisms To E-Waste Life Cycle Stages, Allowing For Problem Identification And Targeted Interventions.

E-Waste Specific Frameworks: Life Cycle Framework for E-Waste Management

Illustrative, Non-Exhaustive

Life Cycle Framework for E-Waste Management

Archetype: Policy Instruments x Mechanisms x Value Chain

Design Principles:

Target: Public Sector

Geography: China

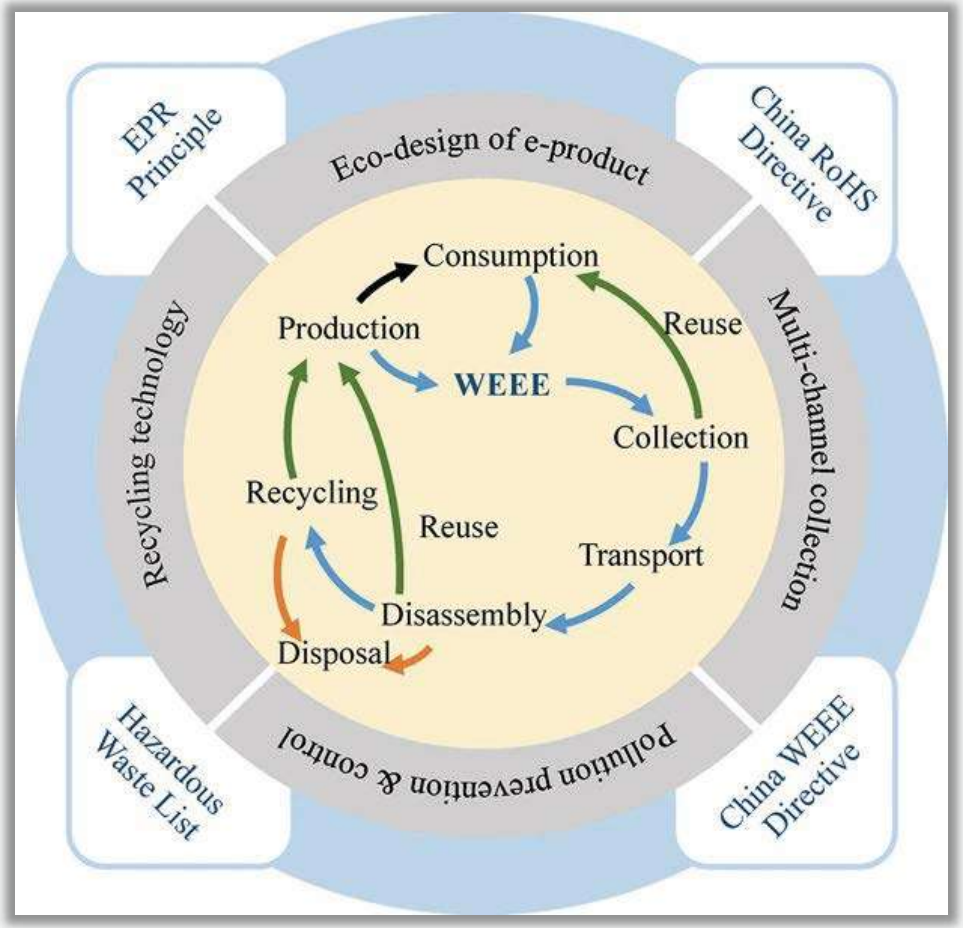
Framework Overview:

Life Cycle Assessments can be utilized to evaluate the environmental performance of e-waste management activities.

- **4 Directives:** Extended Producer Responsibility Principle, China RoHS Directive, Hazardous Waste List, China WEEE Directive
- **4 Mechanisms:** Eco-design of e-products, recycling technology, multi-channel collection, pollution, prevention, and control
- **Value Chain:** Production - Consumption – E-Waste generation – Collection
- **3 steps**: (1) Developing life cycle information for decision-making, (2) implementing life cycle engineering, and (3) improving legislation based on life-cycle thinking

Key Characteristics

Maps directives and mechanisms across the value chain.	Allows specific issues to be identified within the value chain, enabling the development of targeted interventions.	Acknowledges a non-linear value chain, with multiple progression options following some stages.



Source : Journal "Frontiers of Environmental Science & Engineering"

The Policy And Regulatory Frameworks Structure Describes Three Levels Of Policy And Regulation, From Overarching Frameworks To Detailed Collection And Treatment Requirements.

E-Waste Specific Frameworks: Policy And Regulation Frameworks On Waste and EPR in the EU

Illustrative, Non-Exhaustive

Policy and regulation frameworks on waste and EPR in the EU

adelphi

Archetype: Policy Instruments

Design Principles:

Target: Public Sector

Geography: EU

Framework Overview:

This framework categorizes EU policy and regulations into three levels:

- Frameworks (Strategies and Action Plans, Waste Framework Directive, Waste Shipments Regulation)
- Management of specific waste (5 regulations)
- Waste collection and treatment requirements (3 standards/directives such as the Landfill Directive, Industrial Emissions Directive and Collection, Recycling and Treatment Standards)

Key Characteristics

Recognizes the need for multiple levels within the regulatory framework.	Content-focused and descriptive, not describing processes or steps for implementation.	Very focused and limited to regulations.

Figure 2: Policy and regulatory frameworks on waste and EPR in the EU

Source: Analysis of Extended Producer Responsibility Schemes

The Model Framework For E-Waste Management Identifies Policy Focus Areas For Governments, And Details Considerations To Promote Effective E-Waste Management.

E-Waste Specific Frameworks: Model Framework For E-Waste Management In East Africa

Illustrative, Non-Exhaustive

Model Framework for E-Waste Management in East Africa

EACO East African Communications Organisation

Archetype: Mechanisms x Stakeholders

Design Principles:

Target: Public Sector

Geography: East Africa

Framework Overview:

The Model Framework for E-Waste Management outlines five areas that should be leveraged through government commitment to enable an efficient e-waste management system:

- **Legal And Regulatory Framework**
- **Institutional Framework** (Implementation Of E–Waste Management Model Through Stakeholder Collaborations)
- **Resources** (Human, Financial And Infrastructure)
- **Private Sector** (EEE Manufacturers, Traders, Informal Refurbishes/Recyclers)
- **Consumers**

Key Characteristics

Heavily Focused On The Role Of The Government In Relation To The 5 Focus Areas.	Provides Detailed Responsibilities And Considerations Required Of The Government.	No Visual Framework, But Rather A Report With The 5 Focus Areas.

Legal And Regulatory Framework

The Governments of member states have the fundamental role of ensuring that policies are articulated and dynamic, thus ensuring effective legislation, regulations and guidelines that will address the following;

a. Gaps in the existing legal framework for e-waste management;
b. Standards aimed at controlling the nature of ICT equipment (new and used) that are imported in the country;
c. Establishment of the institutional framework on e-waste management;
d. Establishment of gazetted areas for environmental protected areas where collection/storage/recycling of e-waste for effective management and monitoring;
e. Law enforcement regulations;
f. Creating an enabling environment for the NGOs/CBOs as well as investors.

Consumers

The governments' commitment to the consumers includes the establishment of an awareness framework on e-waste management issues, i.e. effects on health and environment, appropriate disposal, etc.

Resources

The Governments' commitment toward resources in adequate e-waste management to include;

a. Human resources To put in place programs that will ensure human capacity on e-waste management is built. Such programs may include; on the job training and introduction of relevant curriculum for schools, colleges and universities.
b. Financial resources Establishment of a resource mobilization mechanism that will ensure sustainability of the e-waste management system, i.e. integration in the national budgetary planning, development of an e-waste fund, proposal on request for funding, business models for e-waste management strategies etc.
c. Infrastructure (facilities) Government commitment would be to put in place appropriate e-waste infrastructure, such as; manual dismantling plants, e-waste recycling, storage/collection and treatment plants, etc.

Institutional Framework

The e-waste model framework to be implemented through the collaboration of stakeholder institutions. These include but are not limited to;

a. The Ministry in charge of ICT to spearhead the development of the e-waste policy and shall therefore be responsible for an all-encompassing strategic plan for implementing the E-Waste policy, detailing the costs, time frames, targets, outputs and outcome and responsibilities of the relevant stakeholders.
b. The Ministry in charge of environment and related natural resources – developing or reviewing the environment act to incorporate e-waste specific legislation.
c. Ministry in charge of health-develop/review health and safety standards, guidelines regarding e-waste.
d. Ministry in charge of trade and investment – develop/review standards on importation of electronics.
e. The regulatory bodies under the respective ministries to provide technical support and guidance to their respective ministries. This also need to be defined in the policy as agreed upon.
f. The EAC to be responsible for putting in place harmonized e-waste management frameworks as well as ensuring strong working relations within the East African member countries towards adequate e-waste management.

Private Sector

The commitment of the government to the private sector would include;

a. To create an enabling environment of appropriate EOL management of e-waste by establishment of partnership and collaborations.
b. Establishment of a Producer Responsibility Organization (PRO) for all manufacturers, importers and resellers of electronic equipment where they will be charged membership fees to cater for the cost of collection and recycling. Determine a harmonized formula of computing the fees.
c. Development of a take-back system that requires producers/importers and distributors/sellers to take back old and End-of-Life (EOL) products.
d. Encourage, support and sensitize the informal sector such as the electronic refurbish/repairers in collection and management of e-waste as this nature of waste is their core business raw material.

Source: East African Communications Organisation

The International Telecommunication Union (ITU) Defines The E-Waste Management Value Chain And Emphasizes The Redeployment Of Used Electronics.

E-Waste Specific Frameworks: ITU E-Waste Management Value Chain

Illustrative, Non-Exhaustive

Stages In The Management Of ICT/UEEE And ICT/E-Waste

Archetype: Value Chain

Design Principles:

Target: Public Sector

Geography: Global

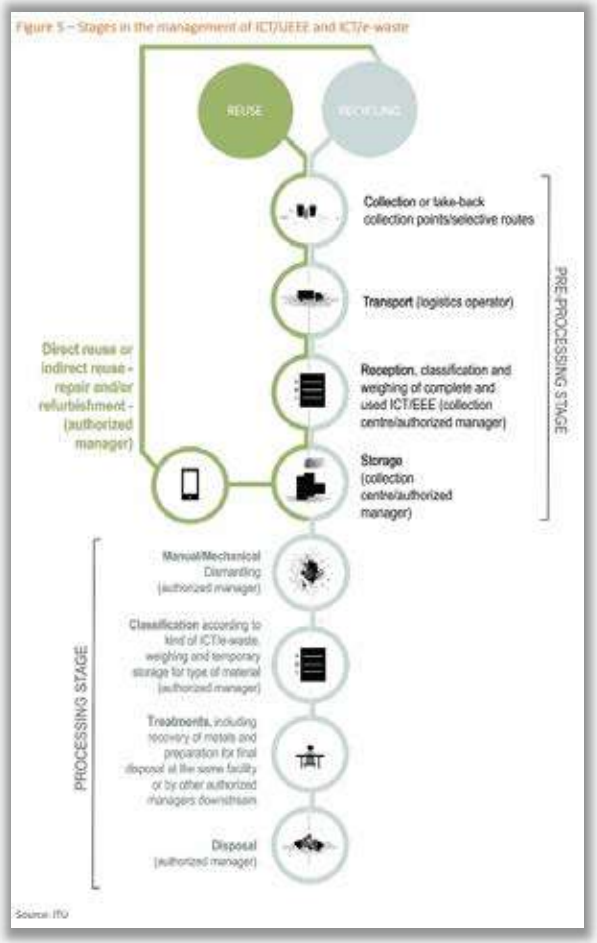
Framework Overview:

The ITU presents an ideal process for e-waste management, broken into two stages (pre-processing and processing)

- **The Pre-processing Stage Includes** E-Waste Collection, Transport, Reception/Classification, And Storage.
- **The Processing Stage Includes** Dismantling, Classification, Treatment, And Disposal.

Key Takeaways

Clearly Defines Different Stages Of E-Waste Processing, including Classification, Treatment And Disposal.	Presents An Aspirational E-Waste Management Value Chain.	Does Not Recognize Informal Or Non-compliant Processes.



Source: ITU

In The Same Handbook, The ITU Outlines Key Considerations For The Development Of A Comprehensive E-Waste Policy Framework.

E-Waste Specific Frameworks: ITU E-Waste Management

Illustrative, Non-Exhaustive

Model Policy Framework For The Management Of ICT/E-Waste

Archetype: Mechanisms x Process

Design Principles:

Target: Public Sector

Geography: Global

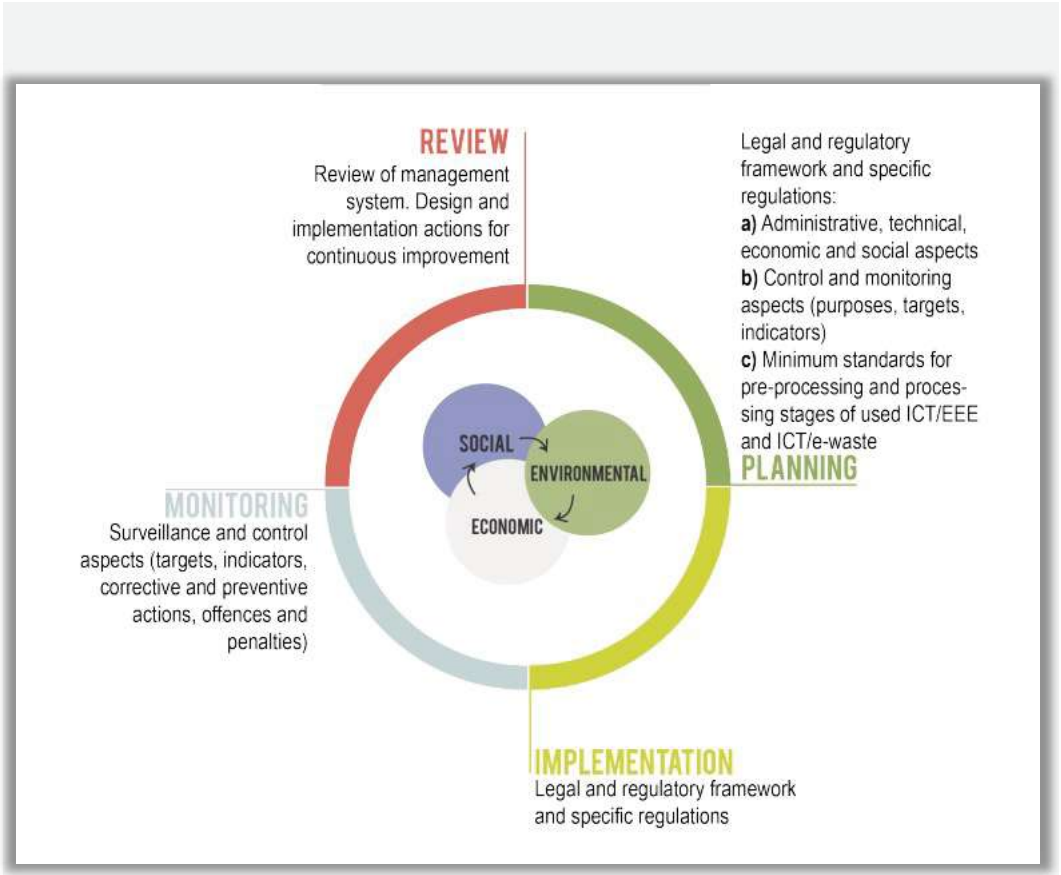
Framework Overview:

The ITU's Handbook outlines key aspects that must be considered to develop a comprehensive policy framework for e-waste management

- **Implementation Steps** Focus On: Review, Planning, Implementation, and Monitoring
  - In Planning, There is a Legal And Regulatory Framework Organized By:
    - Administrative, Social, Environmental, And Economic Aspects .
    - Control And Monitoring Aspects.
    - Minimum Standards For Pre-processing And Processing Stages Of Used ICT/EEE And ICT/E-Waste.

Key Takeaways

Emphasizes the importance of understanding the current state of e-waste management systems.	Provides comprehensive and mutually exclusive categories which should be covered in policy frameworks.	Describes complex, interconnected processes, with value chain, focusing on the triple bottom line.



Source: ITU

The Waste Hierarchy Promotes Circularity By Prioritizing Measures That Enable Waste Prevention, Reuse, And Recycling.

Waste and Sustainability Frameworks: EU Waste Hierarchy

Illustrative, Non-Exhaustive

Waste Hierarchy – From The EU Waste Framework Directive

Archetype: Circularity levers

Design Principles:

Target: Public Sector

Geography: EU

Framework Overview:

The Foundation of EU E-Waste Management is the five-step "Waste Hierarchy", established in the Waste Framework Directive. It establishes an order of preference for managing and disposing of waste.

- The following waste hierarchy applies as a priority order in waste prevention and management legislation and policy: (a) prevention; (b) preparing for re-use; (c) recycling; (d) other recovery, e.g., energy recovery; and (e) disposal.

Key Characteristics

Structured around outcomes, rather than stages of the value chain.	Prioritizes prevention and reuse measures (E.G., Through extending product life cycles and reducing consumption).	Limited to policies and legislative levers, without considering drivers such as investment and other incentives for innovation.

Source: European Commission

The Strategic Framework For The Circular Economy Outlines Over 100 Policy Instruments For Developing A Circular Economy, Including Life-Cycle-Stage-Specific And Key Policies.

Waste and Sustainability Frameworks: Strategic Framework for the Circular Economy

Illustrative, Non-Exhaustive

Strategic Framework For The Circular Economy

TU Delft, ASU Arizona State University, Universiteit Utrecht

Archetype: Policy Instruments

Design Principles:

Target: Public Sector

Geography: Global

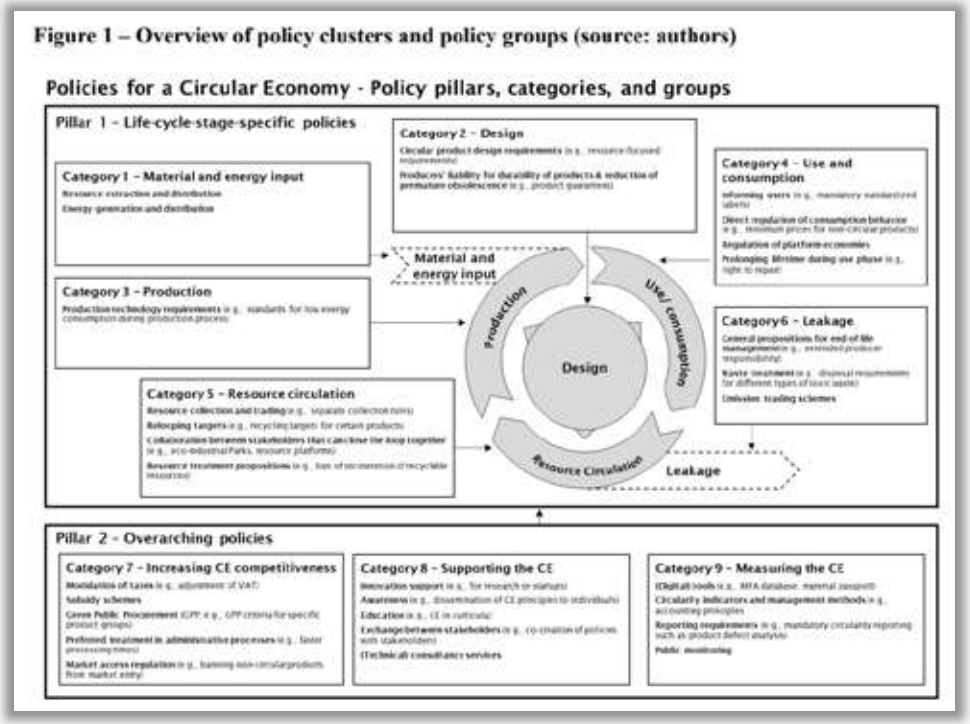
Framework Overview:

The framework identifies policy instruments to enable a circular economy, and provides initial guidance for policy development in diverse contexts

- Policy instruments are grouped **into nine categories:**
  - **Six Categories For Life-Cycle-Stage-Specific Policies** (Material and energy input, design, production, use and consumption, resource circulation, and leakage).
  - **Three Categories For Overarching Policies** (Increasing CE competitiveness, supporting the CE, and measuring the CE).
- **100+ Specific Policy Instruments** (e.g., restrictions, targets, tariffs, incentives, requirements and standards) have been organized into policy groups.

Key Characteristics

Outlines specific policy instruments to operationalize e-waste strategy.	Includes measures from resource extraction and design, to circulation (waste management) and leakage (disposal).	Very detailed and focused, but does not provide input on implementation steps or other government levers.



Source: Journal of Cleaner Production

The UNEP Waste and Climate Change Strategy Framework Aims To Identify Key Levers For Waste Management Based On Stakeholder Input And Identify Main Actions.

Waste and Sustainability Frameworks: UNEP Waste and Climate Change Strategy Framework

Illustrative, Non-Exhaustive

Waste and Climate Change: Strategy Framework

UN environment programme

Archetype: Mechanisms x Action-based

Design Principles:

Target: Public and Social Sector

Geography: Global

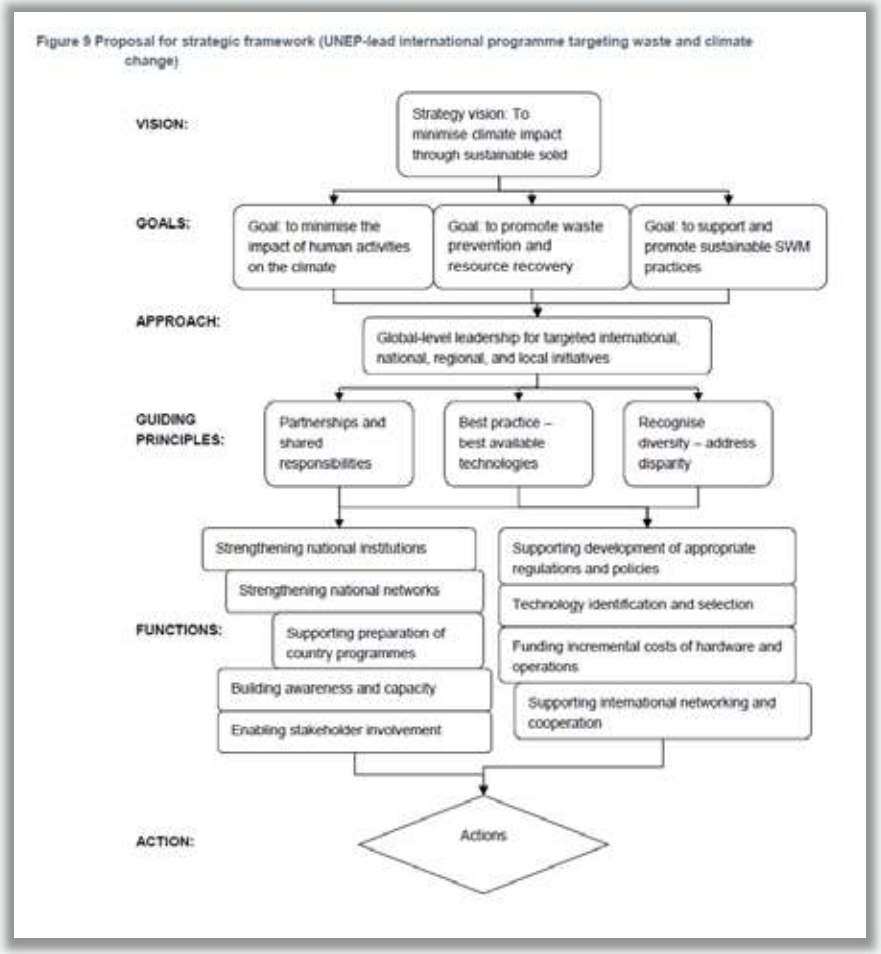
Framework Overview:

The Framework guides leadership of waste management initiatives at an international, national, regional and local level

- **Three Guiding Principles.**
- **Nine Key Functions,** which are used to determine waste management actions.
- **Waste Management Actions** are further **Organized Into Five Categories**: Technical, Policy & regulation, Institutional, Social, and Financial.

Key Characteristics

Centers on key functions/levers which, if achieved through actions, will enable overarching goals.	Suggests specific actions to target identified gaps in existing waste management systems.	Aims to promote a cohesive and comprehensive approach to waste management.



Source: UNEP

The Strategic Framework for Working Toward Zero Waste Societies Focuses On Defining Actions To Enable Waste Prevention, Waste Management, And Monitoring And Assessment.

Waste and Sustainability Frameworks: Strategic Framework for Working Toward Zero Waste Societies

Illustrative, Non-Exhaustive

Strategic Framework for Working Toward Zero Waste Societies

Curtin University

Archetype: Process x Action-based

Design Principles:

Target: Public Sector

Geography: Global

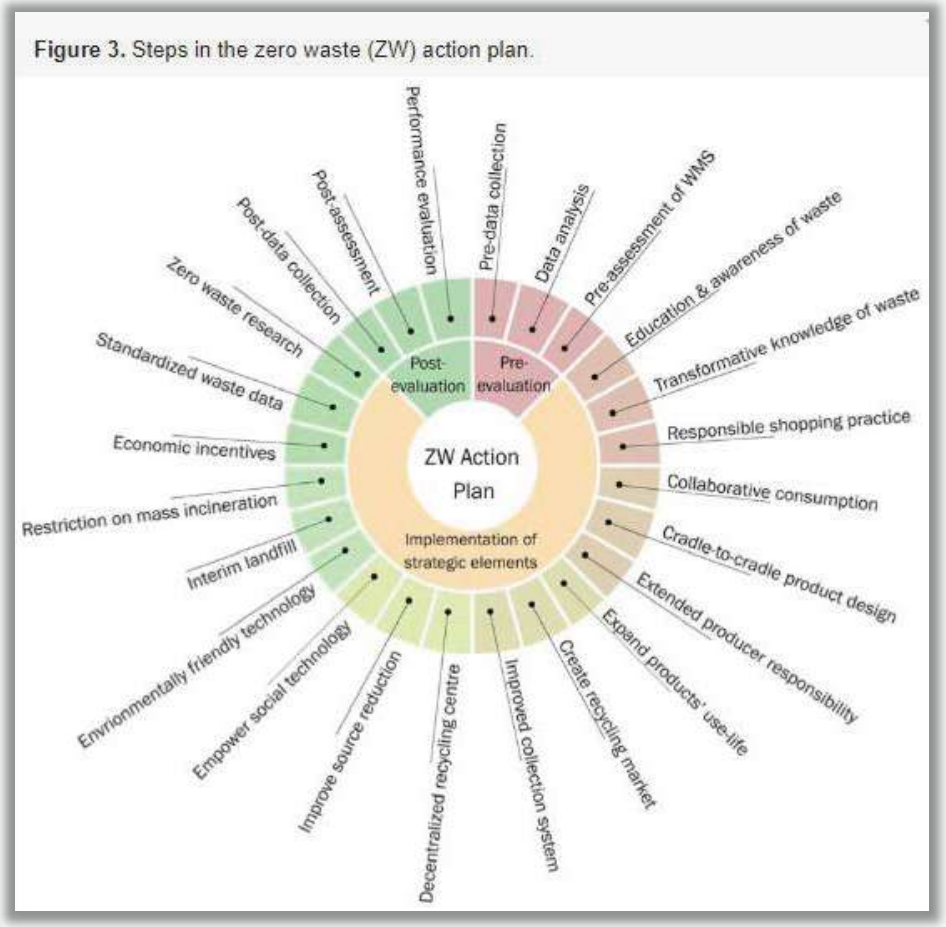
Framework Overview:

The action plan is developed based on expert perceptions of identified issues in waste management, structured across three phases: waste prevention and avoidance, waste management and treatment, and monitoring and assessment

- **Issues identified** include: unsustainable product design, lack of Extended Producer Responsibility, poor collection systems, short product life-cycle, and a need for economic incentives to promote investment.
- These **issues inform the zero-waste action plan**, from pre-evaluation to implementation, to post-evaluation.

Key Characteristics

Focuses on the implementation of actions to directly address identified issues.	Recommends that actions are implemented in an integrated manner, with no specific sequence given.	Focuses on prevention, management and monitoring phases, rather than being structured across the value chain.



Source: Journal "Recycling"

The Plastic Waste Management Framework Enables Countries To Identify Their Level Of Maturity In Plastic Waste Management And Suggests Policies Across Five Key Areas.

Waste and Sustainability Frameworks: Plastic Waste Management Framework

Illustrative, Non-Exhaustive

Plastic Waste Management Framework

ALLIANCE TO END PLASTIC WASTE

Archetype: mechanisms x Maturity Framework

Design Principles:

Target: Public Sector

Geography: Global

Framework Overview:

The framework serves as both a tool for understanding the characteristics of systems at different maturity stages and as a guide for outlining the policy levers, actions, investments, and mechanisms required at each stage.

- **Six Maturity Levels:** undeveloped systems to developed, performing systems.
- **Five Focus Areas For Policies/Levers:** collection infrastructure, waste processing and end-of-life infrastructure, general waste legislation and institutional framework, specific plastic and packaging waste regulation, and supporting tools and mechanisms.
- **Suggests Actions And Enabling Policies**, and details expected effect and enforcement level (national, industry, company level, municipality/regional, and local).

Key Characteristics

Suggests that actions for each policy/lever are directly informed by a country's current state.	Outlines actions that should not be taken at low levels of maturity due to additional factors.	Clearly identifies the different levels of government that should implement specific policies/levers.

Level of Maturity

Policies & Levers	1. UNDEVELOPED SYSTEMS	2. INCIPIENT SYSTEMS	3. DEVELOPING SYSTEMS	4. FUNCTIONAL, LARGELY UNREGULATED SYSTEMS	5. ADVANCED SYSTEMS	6. DEVELOPED, PERFORMING SYSTEMS
Collection Infrastructure						
Waste Processing And End-of-life Infrastructure						
General Waste Legislation And Institutional Framework						
Specific Plastic And Packaging Waste Regulation						
Supporting Tools And Enablers						

Template

Source: Alliance to End Plastic Waste

5. Appendix

Template For The Bilateral Agreement On E-Waste Cross-Border Trade

Digital Cooperation Organization

TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
This column outlines the core structure of the agreement. Both signatory parties should adapt the articles to reflect their shared interests and needs, resulting in a mutually approved version. Please note that this Agreement operates in addition to the requirements of the Basel Convention and is not intended to substitute the Convention's requirements regarding the transboundary movement of hazardous waste.	*This column provides guidelines for tailoring agreements, suggestions, and examples.* *The text that needs to be updated by the country drafting the agreement is highlighted in YELLOW.* *Articles and text specific to an Agreement focused on transboundary movement of e-waste are highlighted in GREEN; remove these articles and text if the Agreement focuses only on knowledge-sharing.* *Articles and text specific to an Agreement focused on knowledge-sharing are highlighted in BLUE; remove these articles and text if the Agreement focuses only on transboundary movement of e-waste.* *Additional articles or details can be added based on the country's requirements and needs.*
Agreement Between the Government of Country 1 and the Government of Country 2 Concerning the Transboundary Movement of Electronic Waste and Knowledge-Sharing Around e-waste Management	*Specify the names of the countries that sign the bilateral agreement.*

This template is intended to serve as a first draft and needs to be updated and reviewed by the country signing the bilateral agreement. The DCO and its service provider do not have any legal responsibility over it.
The text that needs to be updated by the country drafting the agreement is highlighted in YELLOW.
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Additional articles or details can be added based on the country's requirements and needs.
Please note that obligations relating to states of transit are not covered in this template agreement.

TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
PREAMBLE The Government of Country 1 (hereinafter referred to as [shortened name]) and the Government of Country 2 (hereinafter referred to as [shortened name]), collectively referred to as "The Parties": RECOGNIZING that improper treatment, storage, and disposal of electronic waste may cause severe health and environmental damage; SEEKING to ensure that the treatment, storage, and disposal of electronic waste are conducted in a manner that reduces risks to public health, property, and the environment; BELIEVING that a bilateral agreement is essential to facilitate the control of transboundary movements of electronic waste and other waste between Country 1 and Country 2 in compliance with any applicable instruments of international law; RECOGNISING the value of collaboration in areas where the respective functions and activities of the Parties are complementary and mutually supportive, as well as the desire to collaborate through knowledge-sharing to improve environmentally sound e-waste management in both countries; RECALLING the Basel Convention on the Control of Transboundary Movements of Hazardous waste and their Disposal (as amended from time to time, and including any documents ancillary thereto, the "Basel Convention"); RECALLING the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous waste within Africa; and RECALLING the OECD Council Decision on the Control of Transboundary Movements of Wastes Destined for Recovery Operations; Have agreed as follows:	*Specify the names of the countries that sign the bilateral agreement.* *If focused only on transboundary movement of e-waste, remove the BLUE text. If focused only on knowledge-sharing, remove the GREEN text.*

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TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
ARTICLE 1 – DEFINITIONS For the purposes of this Agreement: a) "e-waste"/ "electronic waste" shall have the definition given to it in entry Y49 of Annex II of the Basel Convention, which includes discarded electrical or electronic equipment, including components, sub-assemblies, and consumables, that are no longer intended for reuse by their owner. Certain types of e-waste may also fall under the broader category of Hazardous waste due to its potential to release toxic substances into the environment, such as lead, mercury, cadmium, and brominated flame retardants; b) "Hazardous waste" refers to either: 1. wastes that belong to any category contained in Annex I of the Basel Convention, unless they do not possess any of the characteristics contained in Annex III of the Basel Convention; and 2. Wastes that are not covered under sub-Paragraph (1) but are defined as, or are considered to be, hazardous waste by the domestic legislation of the State of Export or State of Import ; c) "Competent authority" refers to a governmental body designated by a Party to (i) Receive notifications of transboundary movements of Hazardous waste or other wastes; (ii) Handle any information related to such movements; and (iii) Respond to these notifications, each as stipulated in Article 6 of the Basel Convention; d) "Management" refers to the collection, transport, and disposal (including recycling and recovery) of electronic wastes, including aftercare of disposal sites; e) "Environmentally sound management" means taking all practicable steps to ensure that electronic waste is managed in a manner that protects human health and the environment against the adverse effects which may result from such wastes, such steps to take into account any relevant guidelines developed under the Basel Convention (and other relevant guidelines); *[cont.]*	*The two parties should add, change, or delete the definitions below, which are examples and are not meant to be exhaustive.* *Examples:* *"Hazardous Components" means parts or materials from electronic waste that contain hazardous substances, even if separated from the main equipment.* *"End-of-life Equipment" means devices that no longer serve their primary purpose and are subject to disposal, recycling, or recovery processes.*

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TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
[cont.] f) "Transboundary movement" refers to any movement of e-waste from an area under the jurisdiction of one State to or through an area under the jurisdiction of another state or to or through an area not under the jurisdiction of any State, provided that at least two states are involved; g) "State of Export" means the country from which a transboundary movement of electronic waste is planned or initiated; h) "State of Import" means the country to which a transboundary movement of electronic waste is planned or occurs for the purpose of disposal therein or for the purpose of loading prior to disposal in an area not under the national jurisdiction of any state; i) "State of transit" means any state, other than the State of Export or Import, through which a movement of electronic waste is planned or takes place; j) "exporter" means any person under the jurisdiction of the State of Export who arranges for electronic waste to be exported; k) "Generator" means any person whose activity produces electronic waste or, if that person is not known, the person who is in possession and/or control of those wastes, which may or may not be an exporter; l) "importer" means any person under the jurisdiction of the State of Import who arranges for electronic waste to be imported; m) "Disposer" means any person to whom electronic waste is shipped and who carries out the disposal of such wastes, which may or may not be an importer; n) [Additional definitions can follow as required.]	*The two parties should add, change, or delete the definitions below, which are examples and are not meant to be exhaustive.* *<u>Examples</u>:* *"Hazardous Components" means parts or materials from electronic waste that contain hazardous substances, even if separated from the main equipment.* *"End-of-life Equipment" means devices that no longer serve their primary purpose and are subject to disposal, recycling, or recovery processes.*

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TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
ARTICLE 2 – PURPOSE AND SCOPE 2.1) The purpose and scope of this agreement is: a) To establish a framework for the transboundary movement of electronic waste between the Parties for environmentally sound management. b) The following wastes that are subject to transboundary movement shall be referred to as "electronic waste" for the purposes of this Agreement, specifically: i. [Detail the e-waste types/components here, e.g., computers, televisions, printed circuit boards etc.]; ii. [Include additional e-waste types/components as appropriate]. iii. … AND/OR a) To facilitate cooperation and knowledge-sharing on matters of mutual interest related to the improvement and achievement of environmentally sound management of electronic wastes.	*If focused only on transboundary movement of e-waste, remove the BLUE text. If focused only on knowledge-sharing, remove the GREEN text.* *Define the purpose of the agreements.* *Examples (trade scope):* *(a) E-Waste type specific:* – *IT and telecommunication devices* – *Household appliances* – *Temperature exchange equipment* – *Lighting equipment* – *…* *(a) Component specific:* – *Electronic components (including printed circuit boards, processors, memory chips, capacitors, sensors and transistors)* – *Plastic components (including plastic casing and insulation materials)* – *Specific metal components (for example, aluminum/steel casings, copper wire)* – *Glass components (for example, LCD, LED, CRT glass screens and displays)* – *…* *Examples (knowledge-sharing scope):* *a) Regulatory and Policy Framework* *b) Collection and Logistics System* *c) Data and Tracking System* *d) Processing and Recycling Infrastructure* *e) Awareness and Education Programs* *f) Financial Mechanisms* *g) International Collaboration and Compliance* *h) Innovation and Technology Integration* *i) Social impacts of management of electronic waste*

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ARTICLE 3 – GENERAL OBLIGATIONS 3.1) The Parties hereby commit to complying with the terms and conditions in this Agreement, including those related to knowledge-sharing cooperation and transboundary movement of electronic waste. 3.2) The Parties acknowledge that any transboundary movements of electronic waste shall be carried out in compliance with the requirements of the provisions of the Basel Convention and any other international agreements which may be binding on any of the Parties, including but not limited to: 1. [*Insert if relevant:* The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes Within Africa]; 2. The Rotterdam Convention on the Prior Informed Consent procedure for certain hazardous chemicals and pesticides in international trade; 3. the Stockholm Convention on Persistent Organic Pollutants; and 4. the Minamata Convention on Mercury. Should any conflict arise between the provisions of this Agreement and the requirements of the Basel Convention, the requirements of the Basel Convention shall prevail and the relevant provisions of this Agreement giving rise to such conflict shall be null and void insofar as the conflicted issue is concerned. 3.3) The Parties agree that any transboundary movement of electronic waste shall only occur in the circumstances set out in Article 4(9) of the Basel Convention, and no transboundary movement of electronic waste shall occur if the State of Import does not have the technical capacity and the necessary facilities, capacity or suitable disposal sites dispose of the wastes in question in an environmentally sound and efficient manner.	*Define specific general obligations, if applicable.* *If the Agreement focuses only on knowledge-sharing, remove the text highlighted in green. If the Agreement focuses only on transboundary movement of e-waste, remove the text highlighted in blue.*

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CONTENT OF THE AGREEMENT	INSTRUCTION
3.4) The State of Export shall not allow a transboundary movement of electronic waste to commence if it has reason to believe that all the waste in question will not be managed in an environmentally sound manner according to criteria established pursuant to the requirements of the Basel Convention. 3.5) [*To be inserted if one of the parties has ratified the Bamako Convention*] The Parties agree that no Hazardous waste, or hazardous substances which have been (i) banned, canceled or refused registration by government regulatory action, or (ii) voluntarily withdrawn from registration in the country of manufacture for human health and environmental reasons, shall be imported into the IMPORTING (African) COUNTRY. 3.6) [*To be inserted if one of the parties is an OECD/EC member*] The Parties agree that no transboundary movement of Hazardous waste which is destined for the IMPORTING (non-OECD/EC) COUNTRY shall be permitted. 3.7) Immediately following the entry into force of this agreement, the Parties shall notify the Secretariat of the Basel Convention that this Agreement has been entered into, pursuant to the requirements of Article 11(2) of the Basel Convention. The parties shall also comply with their notification obligations set out in Article 13 of the Basel Convention which may be relevant to this Agreement.	*Define specific general obligations, if applicable.* *If the Agreement focuses only on knowledge-sharing, remove the text highlighted in green. If the Agreement focuses only on transboundary movement of e-waste, remove the text highlighted in blue.*

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ARTICLE 4 – NOTICE AND CONSENT 4.1) The competent authority of the State of Export shall notify the competent authority of the State of Import in writing of the proposed transboundary movements of electronic waste to be carried out under this agreement. 4.2) The notice referred to in Paragraph 1 above may cover an individual shipment or a series of shipments over a twelve-month or lesser period where the electronic wastes in question have the same physical and chemical characteristics and are shipped regularly to the same facility via the same customs office of exit in the State of Export and the same customs office of entry in the State of Import. If any information in the notice changes, a new notice shall be provided. 4.3) The notice referred to in Paragraph 1 above shall contain the declarations and information, written in the English language, specified in Annex V A of the Basel Convention, and shall state clearly the effects of the proposed movement on human health and the environment. 4.4) With respect to the electronic wastes to be shipped: a) The competent authority in the State of Import shall, in accordance with applicable law of the State of Import, respond to the competent authority of the State of Export in writing, consenting to the shipment with or without conditions, denying permission for the shipment, or requesting additional information. The competent authority of the State of Import shall seek to respond within thirty (30) days of receipt of this notice. b) The consent of the competent authority of the State of Import, including conditional consent, may be withdrawn or modified for a good cause. In such a case, the State of Import shall notify the State of Export within thirty (30) days of the competent authority's (of the State of Import) discovery of the good cause. "Good cause" means the introduction of new facts or developments or the discovery of fraudulent information that renders incomplete or invalid the prior basis for consent or conditional consent.	*Remove this article if the scope of the agreement only includes knowledge-sharing.* *Update the names of the Importing and Exporting countries.* *Review the conditions highlighted in yellow and agree with the other party on the timeframes for each sub-article.* *Note that twelve months is the maximum period permitted by the Basel Convention.* Annex V: For more details, please check the Basel Convention > The Convention > Overview > Text of the Convention

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CONTENT OF THE AGREEMENT	INSTRUCTION
4.5) The State of Export shall not allow a transboundary movement of electronic waste to commence until its competent authority has received: a) the written consent of the State of Import; and b) written official communication from the State of Import confirming the existence of a contract between the exporter and the importer in the State of Import specifying the importer's environmentally sound management of the electronic waste in question. 4.6) The State of Import shall not consent to, shall withdraw its consent to, or prevent a transboundary movement of electronic waste if it has reason to believe that all the waste in question will not be managed in an environmentally sound manner. 4.7) The management of electronic wastes, once subject to the jurisdiction of the State of Import, shall be subject to applicable law in the State of Import. The State of Import shall ensure that the disposer of the electronic waste notifies both the exporter and the competent authority of the State of Export upon receipt of the electronic waste in question and upon completion of disposal. The State of Export shall notify the competent authority of the State of Import if it does not receive this information.	*Remove this article if the scope of the agreement only includes knowledge-sharing.* *Update the names of the Importing and Exporting countries.* *Review the conditions highlighted in yellow and agree with the other party on the timeframes for each sub-article.* *Note that twelve months is the maximum period permitted by the Basel Convention.* Annex V: For more details, please check the Basel Convention > The Convention > Overview > Text of the Convention

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[illegible]ENT	INSTRUCTION
ARTICLE 5 – COOPERATIVE EFFORTS 5.1) The Parties shall cooperate to ensure compliance with applicable tracking documents and legal requirements for transboundary movements of electronic waste. 5.2) The Parties shall cooperate to ensure that transboundary movement of electronic waste conforms to the requirements of applicable law of both Parties and of this Agreement. In particular, this shall include ensuring that any e-waste which is to be the subject of a transboundary movement shall: a) only be transported or disposed of by persons who are authorized or allowed to perform such types of operations; b) be packaged, labeled and transported in conformity with generally accepted and recognized international rules and standards in the field of packaging, labelling, and transport, (with due account to be taken of relevant internationally recognized practices); and c) be accompanied by a movement document (setting out the required information in Annex V B of the Basel Convention) from the point at which the transboundary movement commences to the point of disposal. 5.3) Cooperation shall include sharing relevant information, technical expertise, and best practices for managing electronic waste.	*Remove this article if the agreement scope only includes Knowledge-Sharing.*

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	INSTRUCTION
ARTICLE 6 – DUTY TO REIMPORT In the event a transboundary movement of electronic waste cannot be completed in accordance with the terms of the contract and alternative arrangements for the proper management in an environmentally sound manner of the electronic waste cannot be made (irrespective of whether the State of Import has given its consent), the State of Export shall, by itself or through the exporter, ensure that the wastes in question are taken back into the State of Export within 90 days from the time that the competent authority of the State of Import has so informed the competent authority of the State of Export or within such other period of time as the parties may agree. To this end, the Parties shall not oppose, hinder, or prevent the return of electronic waste to the State of Export.	*Remove this article if the agreement scope only includes Knowledge-Sharing.* *Update the names of the Importing and Exporting countries.* *Review the timeframe highlighted in yellow and agree with the other Party.*

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[illegible]T	INSTRUCTION
ARTICLE 7 - ILLEGAL TRAFFIC 7.1) In the case of a transboundary movement of electronic waste not in accordance with this Agreement or the Basel Convention as a result of conduct on the part of the exporter, the State of Export shall ensure that the electronic waste in question is taken back by the exporter or the generator (or, if necessary, by itself) to the State of Export, within 30 (thirty) days from the time that the State of Import receives a notice about the illegal traffic or within such other period of time as the Parties may agree. To this end, the Parties shall not oppose, hinder, or prevent the return of electronic waste to the State of Export. 7.2) In the case of a transboundary movement of electronic waste not in accordance with this Agreement or within the Basel Convention as a result of conduct on the part of the importer, the State of Import shall take appropriate enforcement measures to require the importer or disposer to (or, if necessary, shall itself) dispose of the electronic waste in question in an environmentally sound manner within 30 days from the time the illegal traffic has come to the attention of the State of Import or within such other period of time as the Parties may agree. To this end, the Parties shall cooperate, as necessary, in the electronic waste management by the importer in an environmentally sound manner. 7.3) In the case where responsibility for the illegal traffic cannot be assigned either to the exporter, generator, importer, or disposer, the Parties shall cooperate to ensure that the electronic waste in question is disposed of as soon as possible in an environmentally sound manner in the State of Export, the State of Import, or elsewhere as appropriate.	*Remove this article if the scope of the agreement only includes knowledge-sharing.* *Update the names of the Importing and Exporting countries.*

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CONTENT OF THE AGREEMENT	INSTRUCTION
ARTICLE 8 – MODALITIES OF COOPERATION FOR KNOWLEDGE SHARING 8.1) The Parties shall cooperate to achieve the [purpose/objectives] of this Agreement, particularly in relation to the transboundary movement of electronic waste. Cooperation may include, but is not limited to: a) Facilitating the exchange of information and best practices on electronic waste management policies, technologies, and regulatory frameworks; b) Supporting joint projects and initiatives to strengthen electronic waste management capacity; and c) Promoting regional and bilateral partnerships to enhance technical, legal, and institutional capacities for the transboundary movement of electronic waste. 8.2) The Parties shall endeavor to establish or utilize existing knowledge-sharing platforms for the purpose of: a) Disseminating technical guidelines and best practices related to the environmentally sound management of electronic waste; b) Facilitating the sharing of research, case studies, and innovative technologies for electronic waste reduction, recycling, and recovery; and c) organizing workshops, webinars, and training sessions to enhance the capacity of stakeholders involved in electronic waste management. 8.3) To ensure effective implementation of this Agreement, the Parties shall endeavor to exchange information, subject to applicable confidentiality obligations under the laws of each Party, including: a) National laws, regulations, and standards related to the transboundary movement of electronic waste; b) Data on the quantities and characteristics of electronic waste exported, imported, or in transit under this Agreement; and c) Details of incidents or accidents occurring during the transboundary movement of waste, including measures taken to mitigate adverse effects.	*We have inserted some suggested avenues of cooperation as a starting point for discussion, but parties should review them and add to or delete provisions as desired.* ***Further examples:*** (a) *Conducting online working sessions between the relevant Government departments responsible for e-waste management every X (xxx) months to facilitate knowledge-sharing and collaborative problem solving* *(b) Exchanging information, research, statistics, and other data.* *(c) Conducting studies and research, organizing conferences, workshops, policy forums, and expert meetings;* *(d) Authoring, editing, and publishing journals, articles, reviews, books, and other scholarly or technical publications;* *(e) Undertaking programming missions, outreach, and fundraising activities;* *(f) Exchanging personnel, sponsoring a Partner-Expert or staff on secondment;* *(g) Training government officials, project counterparts, national experts, and consultants;* *(h) Formulating pilot and demonstration projects;* *(i) Promoting environmentally sound management of Hazardous waste to businesses and consumers in their respective states* *(j) …*

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8.4) The Parties shall provide each other with capacity-building and technical assistance, as appropriate, to: a) Develop and implement effective policies and strategies for the environmentally sound management of electronic waste; b) Strengthen enforcement mechanisms, identification and prevention of illegal traffic, and compliance with this Agreement; and c) Support the development and transfer of environmentally sound technologies relevant to electronic waste management. 8.5) The Parties shall encourage and support joint research, innovation, and development initiatives to address challenges associated with the transboundary movement and management of electronic waste, including: a) Developing advanced digital tools and systems to track and monitor movements of electronic waste; b) Exploring innovative recycling, recovery, and disposal methods for electronic waste; and c) Investigating social and economic impacts and opportunities of improved electronic waste management practices. 8.6) Notwithstanding Article 14, the Parties shall periodically review the progress and effectiveness of cooperation and knowledge-sharing initiatives under this Agreement, including: a) Establishing a joint committee or working group to provide oversight of implementation; b) Conducting annual or biennial reviews to identify areas for improvement; and c) Publishing joint reports on the outcomes of cooperative activities, where appropriate, to enhance transparency and accountability. 8.7) The Parties shall negotiate in good faith the terms of any subsequent agreement(s) necessary to implement their collaboration at the project level. Such agreement(s) shall be subject to the provisions of this Agreement and the applicable laws & regulations of both Parties. 8.8) Nothing in the Agreement shall be interpreted as granting any license or permission to a Party regarding the other Party's intellectual property. If applicable, intellectual property rights arising from or related to the Parties' cooperation shall be governed by a separate agreement negotiated and concluded between the Parties.	*We have inserted some suggested avenues of cooperation as a starting point for discussion, but parties should review them and add to or delete provisions as desired.* ***Further examples:*** (a) *Conducting online working sessions between the relevant Government departments responsible for e-waste management every X (xxx) months to facilitate knowledge-sharing and collaborative problem solving* *(b) Exchanging information, research, statistics, and other data.* *(c) Conducting studies and research, organizing conferences, workshops, policy forums, and expert meetings;* *(d) Authoring, editing, and publishing journals, articles, reviews, books, and other scholarly or technical publications;* *(e) Undertaking programming missions, outreach, and fundraising activities;* *(f) Exchanging personnel, sponsoring a Partner-Expert or staff on secondment;* *(g) Training government officials, project counterparts, national experts, and consultants;* *(h) Formulating pilot and demonstration projects;* *(i) Promoting environmentally sound management of Hazardous waste to businesses and consumers in their respective states* *(j) …*

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ARTICLE 9 – FINANCIAL MATTERS The Agreement does not establish an obligation on the part of any Party to provide any form of funding to the other Party.	*N/A*
ARTICLE 10 – PROTECTION OF INFORMATION *OPTION 1:*[Each Party shall protect any information exchanged or obtained, and identified as confidential, in connection with this Agreement. Such information shall not be disclosed to any third-party without the prior written consent of the Party providing the information, except as required by the applicable law of that Party. Each Party shall ensure that confidential information is used solely for the purposes for which it was provided and is safeguarded in a manner that prevents unauthorized access or disclosure.] *OPTION 2:* [If the provision of technical information pursuant to Article 4 would require the disclosure of information covered by agreements of confidentiality between a Party and an exporter, the State of Export shall make every effort to obtain the consent of the concerned person for the purpose of conveying any such information to the State of Import or state of transit. The State of Import shall make every effort to protect the confidentiality of such information conveyed.]	*N/A*

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ARTICLE 11 – DISPUTE SETTLEMENT 11.1) Either Party may request, in writing, consultations with the other Party regarding any dispute arising between the Parties regarding the interpretation or implementation of this Agreement. The Parties shall use their best efforts to resolve any dispute arising from the interpretation or implementation of this Agreement through consultations and negotiations in good faith. 11.2) If a dispute remains unresolved [for 60 days] after consultations have commenced, the Parties may agree to refer the matter to a mediation or conciliation process, facilitated by a third-party mediator or conciliator selected by mutual agreement of the Parties. The Parties shall consider any recommendations of the mediator or conciliator in good faith. 11.3) Should mediation or conciliation fail to resolve the dispute within [90 days] of its initiation, the Parties may agree to submit the matter to arbitration. The arbitration may be binding or non-binding, as mutually agreed by the Parties, and shall be conducted in accordance with the procedures set forth in a separate arbitration agreement, as may be applicable, or under the UNCITRAL Arbitration Rules, unless the Parties agree otherwise. The location and language of the arbitration proceedings, as well as the appointment of arbitrators, shall be determined by mutual agreement of the Parties. 11.4) If no resolution is reached under the above mechanisms, the Parties may, by mutual agreement, submit the dispute to the International Court of Justice or another judicial body. The decision to submit the matter to such a body shall not preclude either Party from seeking alternative peaceful solutions.	*Note that many other bilateral agreements entered into under the Basel Convention do not have dispute settlement clauses - it would be open to the parties to delete this drafting and rely on existing conflict resolution mechanisms*
ARTICLE 12 – AMENDMENT This Agreement may be amended by mutual written consent of the Parties.	*N/A*

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Articles and text specific to an Agreement focused on knowledge-sharing are highlighted in BLUE; remove these articles and text if the Agreement focuses only on transboundary movement of e-waste.
Additional articles or details can be added based on the country's requirements and needs.
Please note that obligations relating to states of transit are not covered in this template agreement.

TEMPLATE FOR A BILATERAL AGREEMENT ON TRANSBOUNDARY MOVEMENT AND KNOWLEDGE SHARING RELATING TO ELECTRONIC WASTE

(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
ARTICLE 13 – ENTRY INTO FORCE, VALIDITY AND RENEWAL 13.1) This Agreement shall enter into force upon written notification between the Parties stating that each Party has completed its necessary approval procedures.	*N/A*
ARTICLE 14 – REVIEW The Parties shall meet at least every [two] years from the date of entry into force of this Agreement, at a mutually-agreed time and place, in order to review the effectiveness of its implementation and to agree on any individual or joint measures necessary to improve its effectiveness.	*N/A*
ARTICLE 15 – TERMINATION 15.1) Either Party may terminate this Agreement by giving written notification to the other Party, in which case the Agreement shall terminate [six] months after the date of such written notification. 15.2) Unless the Parties agree otherwise, the termination of this agreement shall not relieve either Party of its obligations concerning the environmentally sound management of transboundary movements of electronic waste initiated prior to the effective date of termination. Such movements shall continue to be managed in accordance with the provisions of this Agreement until their completion. 15.3) Following notice of termination, the Parties shall cooperate in good faith to ensure the orderly conclusion of ongoing activities and minimize any adverse environmental impacts arising from the termination.	*Agree and detail the termination notice period.* ***Examples**:* *(a) …180 (one hundred eighty) days following the date of notification;* *…90 (ninety) days following the date of notification*

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(Assuming Countries Are Signatories Of The Basel Convention)

Directional, Non-Exhaustive

CONTENT OF THE AGREEMENT	INSTRUCTION
In witness of this, the undersigned, being duly authorized by their respective Governments, have signed this Agreement. Done at _____(location)_____ on this _(dd)___ day of _____(month)_____ , __(year)_____ Duly authorized to sign for the Government of Country 1: *Signature* Name: XX Title: XX Duly authorized to sign for the Government of Country 2: *Signature* Name: XX Title: XX	*Enter details regarding the signature's location and date, as well as the representatives' details and signature.*

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Acknowledgment

Digital Cooperation Organization

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Lead Authors:

1. Dr. Syed Iftikhar H. Shah, Digital Research Director, Digital Cooperation Organization (DCO), DCO H/Q, Riyadh, KSA
2. Fabrice Nkusi, Digital Research Manager, Digital Cooperation Organization (DCO), DCO H/Q, Riyadh, KSA

Special Acknowledgment:

Alaa Abdulaal, Chief of Digital Economy Intelligence, DCO

@dcorg | www.dco.org