

Implementación de los estándares internacionales del UIT-T para la gestión sostenible de residuos de aparatos eléctricos y electrónicos:  
En ruta hacia una economía circular en Costa Rica



En colaboración con:



# Implementation of ITU-T standards: Costa Rica Case Study

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# International Telecommunication Union (ITU)

## WHO WE ARE :

ITU is the United Nations specialized agency for information and communication technologies (ICT).

## WHAT IS OUR ROLE:

Facilitate peaceful relations, international cooperation among people, and economic and social development through efficient telecommunications services



**PROMOTE GLOBAL COLLABORATION FOR A CONNECTED WORLD**

# ITU's work on sustainable management of waste from electrical and electronic equipment and promoting a circular economy



Develop Standards and National Policies



Develop International Standards



Improve and collect data



Projects and Activities



UN E-Waste Coalition



Reports and Publications

# The role of International Organisations

**Connect  
2030**



GROWTH



INCLUSIVENESS



SUSTAINABILITY



INNOVATION



PARTNERSHIP

**Coalition for  
Electronic Waste**



UNITED NATIONS  
UNIVERSITY



BASEL CONVENTION ROTTERDAM CONVENTION STOCKHOLM CONVENTION



unitar

United Nations Institute for Training and Research



International  
Labour  
Organization



World Health  
Organization



International  
Trade  
Centre

UN HABITAT  
FOR A BETTER URBAN FUTURE

# Solving Problems Together

## ITU Activities



UN Specialised Agency for ICTs



ITU-T Study Group 5: Environment, climate change and circular economy



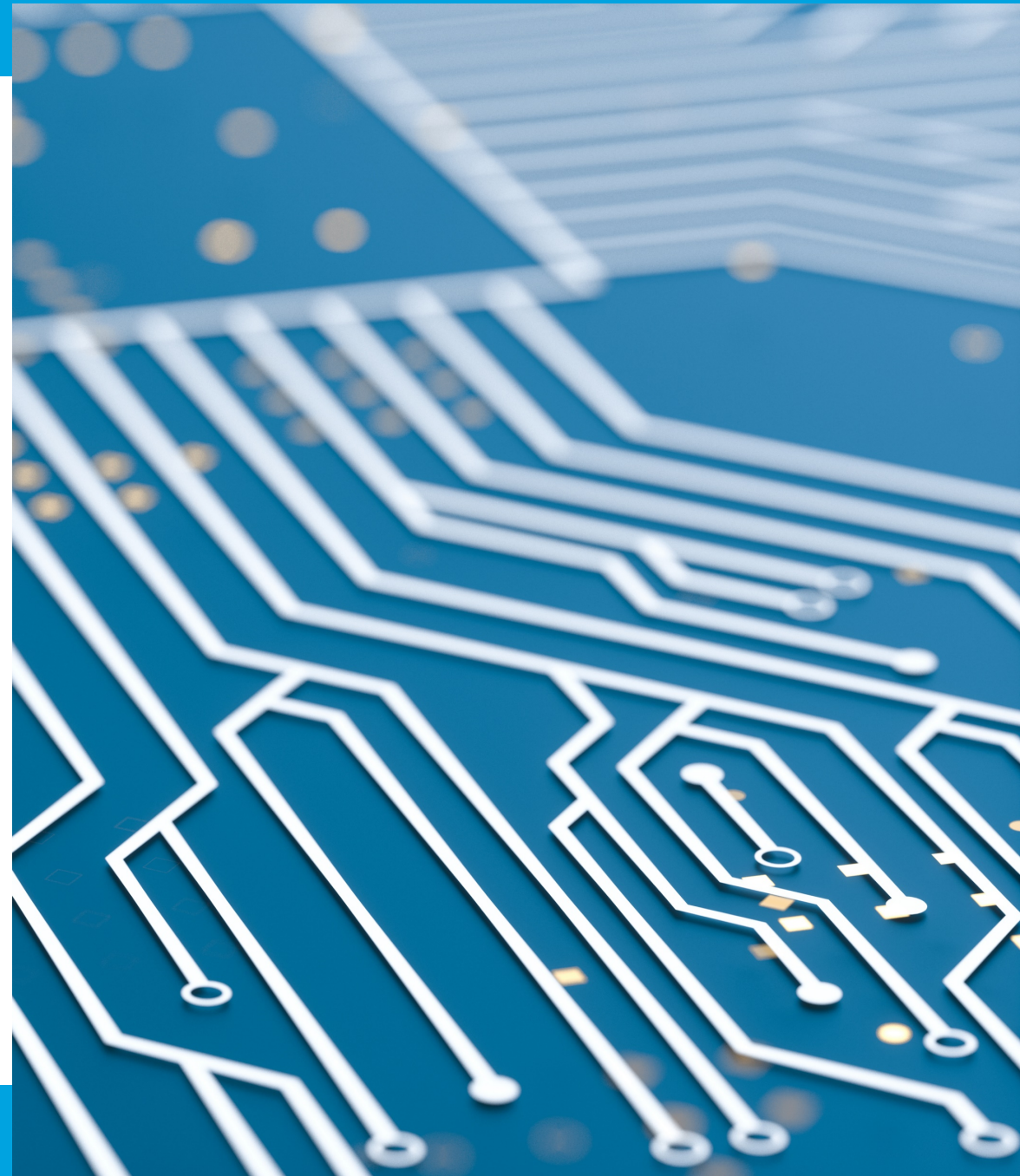
ITU Green Standards Week



Awareness Raising and Capacity Building

## ITU-T Study Group 5

1. Electromagnetic compatibility, protection against lightning and electromagnetic effects
2. ICTs related to environment, climate change, energy efficiency and clean energies
3. **Circular economy, including e-waste**



# Case Study: Costa Rica



**Territory**  
51 180 km<sup>2</sup>



**Population** 49,6%  
5 111 238 50,4%



**IDH** HDI (2019)  
0,81 (62)



**GDP (2020)**  
\$61.520 M



**GDP per capita (2020)**  
\$12.076,80



**Imports amounted to (2019)**  
\$16.106 M

### Sources:

Great Metropolitan Area  
National Institute of Statistics and Census



National Geoenvironmental Information Centre, 2021



National Institute of Statistics and Census, 2011



United Nations Development Program, 2020



<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=CR>



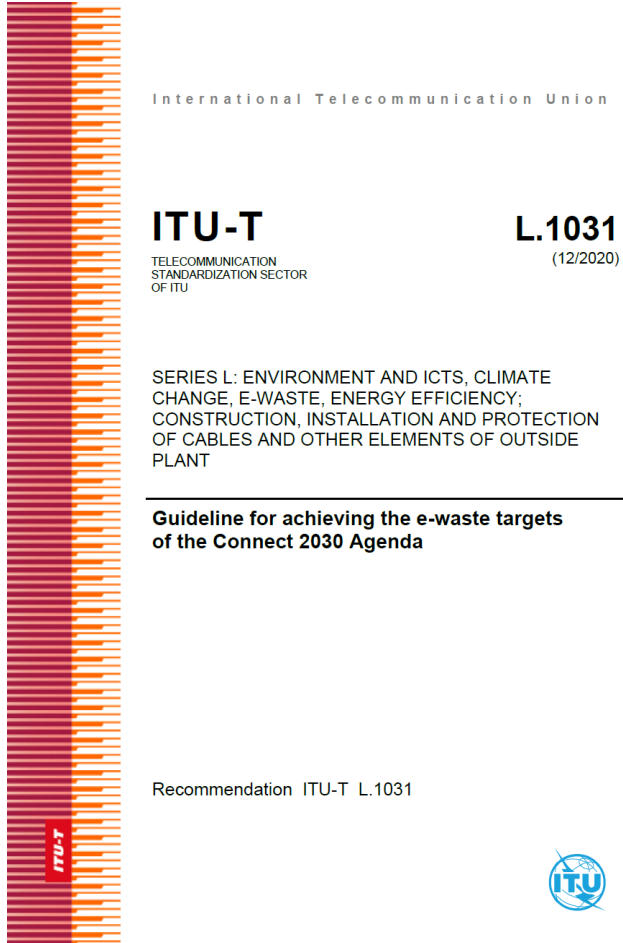
<https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=CR>



Ministry of Foreign Trade of Costa Rica, 2020

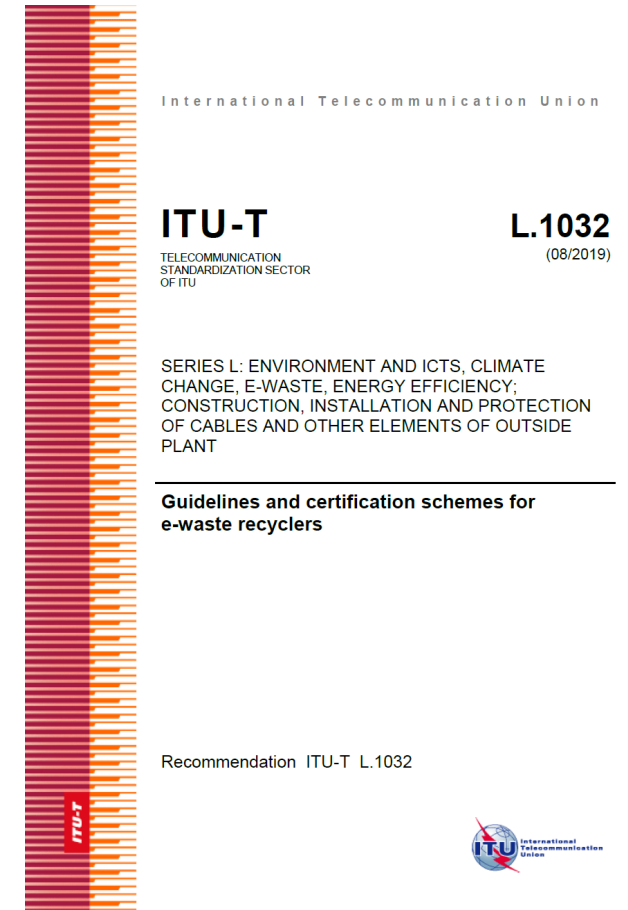


# WEEE sustainable management and Circular Economy – ITU-T Recommendations



ITU-T L.1031: Guideline on implementing the e-waste reduction target of the Connect 2030 Agenda

ITU-T L.1032: Guidelines and certification schemes for e-waste recyclers.

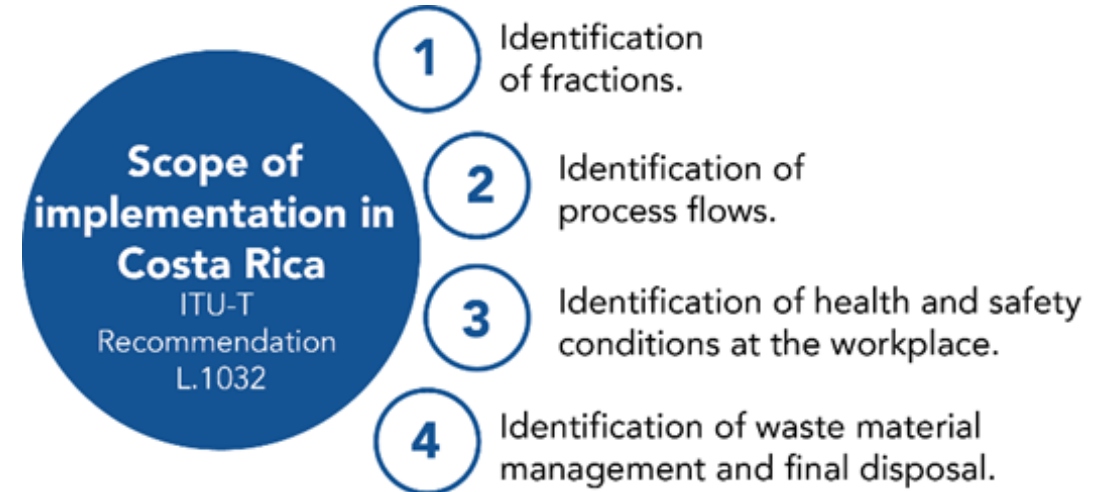


# Scope of the implementation of ITU-T Recommendations in Costa Rica

## ITU-T L.1031 for Costa Rica



## ITU-T L.1032 for Costa Rica



### Political Constitution of Costa Rica, 1949

### International Conventions

Basel, Stockholm, Minamata, Montreal Protocol.

### Public Policy

National Policy on Integral Waste Management 2010-2021

National Policy on Entrepreneurship 2020-2030

### Legislation

General Health Law, Nr 5395 (1974)  
Law on Integral Waste Management, Nr 8839 (2010)

Executive Decree 37567: General Regulations of Law on Integral Waste Management (2013)

Executive Decree 38272 Regulations on Declaration of Special Handling Waste (2014)

Executive Decree 35933 Integral Management of Electronic Waste Regulations (2010)

Executive Decree 41052 Take Back Centres for Waste Recovery Regulations (2018)

Executive Decree 41527 Classification and Management of Hazardous Waste General Regulations (2018)

### National Plans

National Plan for Integral Waste Management (2016-2021)

Action Plan for Integral Waste Management (2019-2025)

National Decarbonisation Plan (2018-2050)

Municipal Plans for Integral Solid Waste Management

### Strategies

National Strategy for Waste Separation, Recovery, and Valorisation (ENSRVR) 2016-2021

National Climate Change Strategy

National Strategy for the Substitution of Single-Use Plastics 2017-2021

Costa Rica's National Bioeconomy Strategy 2020-2030

### Technical instruments and standards

Technical Guide for the Integral Management of Electronic and Electrical Waste

INTE G28:2013 Integrated Management System for Micro, Small and Medium-sized Enterprises (SMEs)

# Regulatory framework for WEEE management in Costa Rica

## CEGIRE

### Coordinator: Ministry of Health

Ministry of Environment and Energy (MINAE)

Ministry of Science, Innovation, Technology, and Telecommunications (MICITT)

Institute for Municipal Development and Advisory Services (IFAM)

State Universities

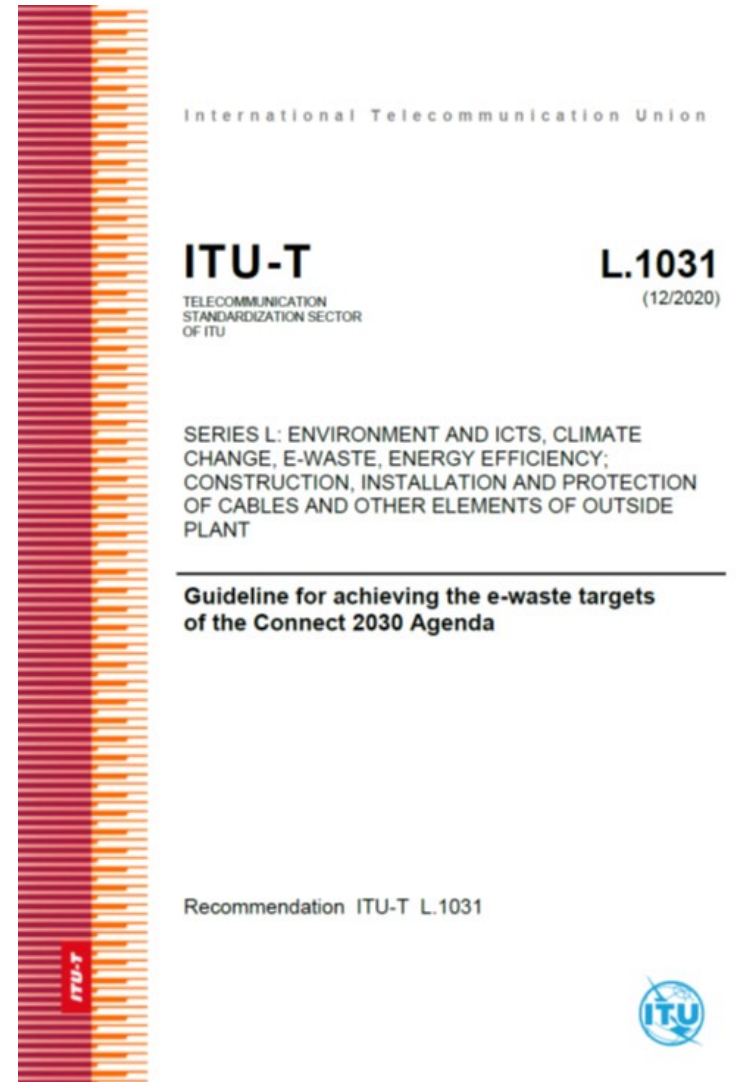
Costa Rican Union of Chambers and Associations of Private Enterprise (UCCAEP)

Compliance Units (CU)

Non-governmental organizations specialized in e-waste (NGO)

Members

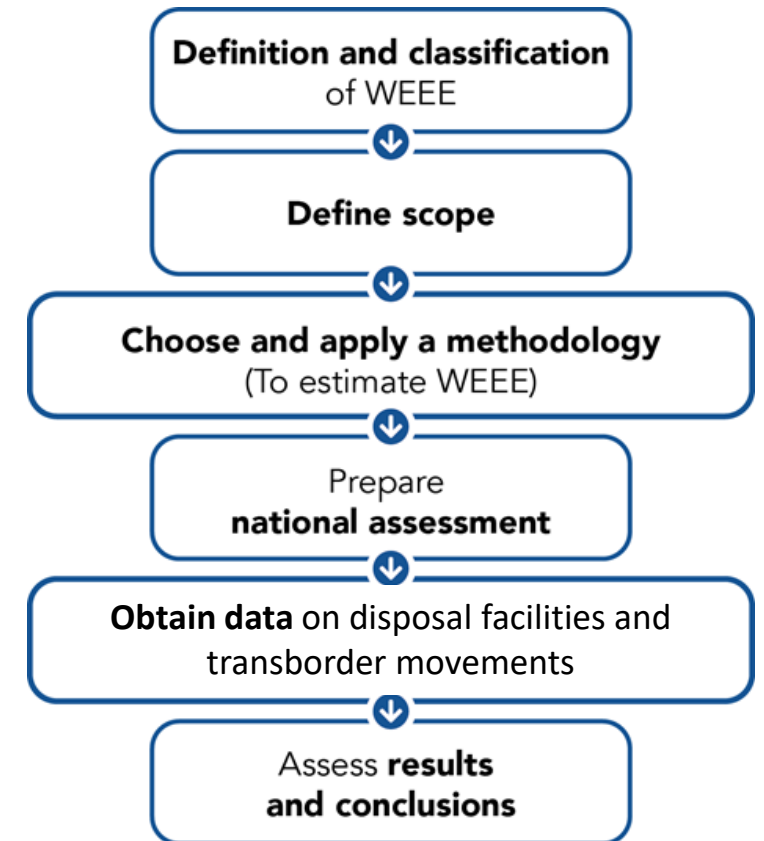
# Implementation of Recommendation ITU-T L.1031



# Implementation of Recommendation ITU-T L.1031

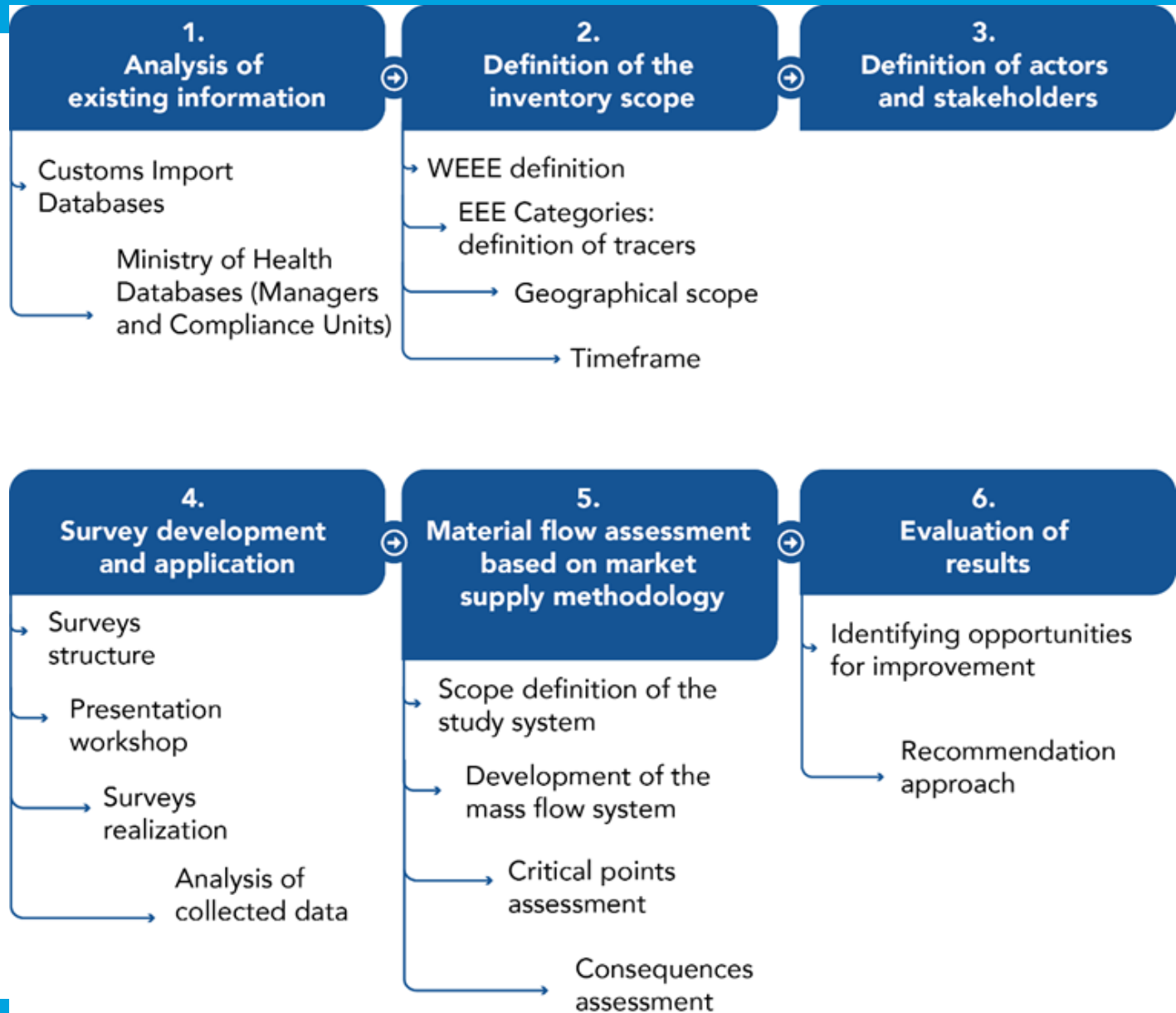


Steps to achieve the e-waste reduction targets according to Recommendation ITU-T L.1031



WEEE inventory in six steps based on Basel Convention

# Implementation of Recommendation ITU-T L.1031



## Process for the selection of tracers for Costa Rica's inventory

### Analysis of Customs import databases

- The longest possible time horizon was taken (2005-2020).
- The six-digit HS (HS6) subheadings with regular imports over time were selected.
- The total imported weights were obtained for each subheading selected in the previous step.
- The total weight for the total imported EEE was obtained

### Application of Pareto's principle

- The HS6 subheadings selected in the previous step were ordered from the highest to the lowest weight.
- The percentage of each HS6 subheading in relation to total EEE imports was derived.
- The relative percentages for selected HS6 subheading were obtained.
- The HS6 subheadings accumulating 80 % of the weight were selected.

### Application of criteria

- It was verified that the EEE fell into one of the EMPA recommended tracer categories.
- The association between WEEE's HS codes and UNU-KEYs was considered to be clear and straightforward.
- The consumption characteristics of Costa Ricans were taken into account.
- The consumption characteristics of the selected costarrician were taken into account in case of inappropriate disposal.

### Definition of tracers

- 11 tracers were selected for the study, which are listed in Table 5

**Selected  
tracers for  
Costa Rica`s  
Case Study**

Category	Tracer
Large household appliances	Refrigerators
	Washing machines
Television sets	Flat-panel televisions
	CRT televisions
Telecom equipment	Cell phones
Computers	Laptops
	PC
	Small IT
	Flat-panel monitors
	CRT monitors
	Printers



Information  
baseline

## Market supply methodology

Existing EEE statistics, including import/export statistics.

Phase 1

EEE placed on the market for the relevant equipment categories are estimated from key data such as imports of new/second-hand products, exports, and domestic production.

Phase 2

Estimation of WEEE generated based on the average lifetime of each category.

Base de  
información

## Consumption-based methodology

Data collection methods such as studies and surveys.

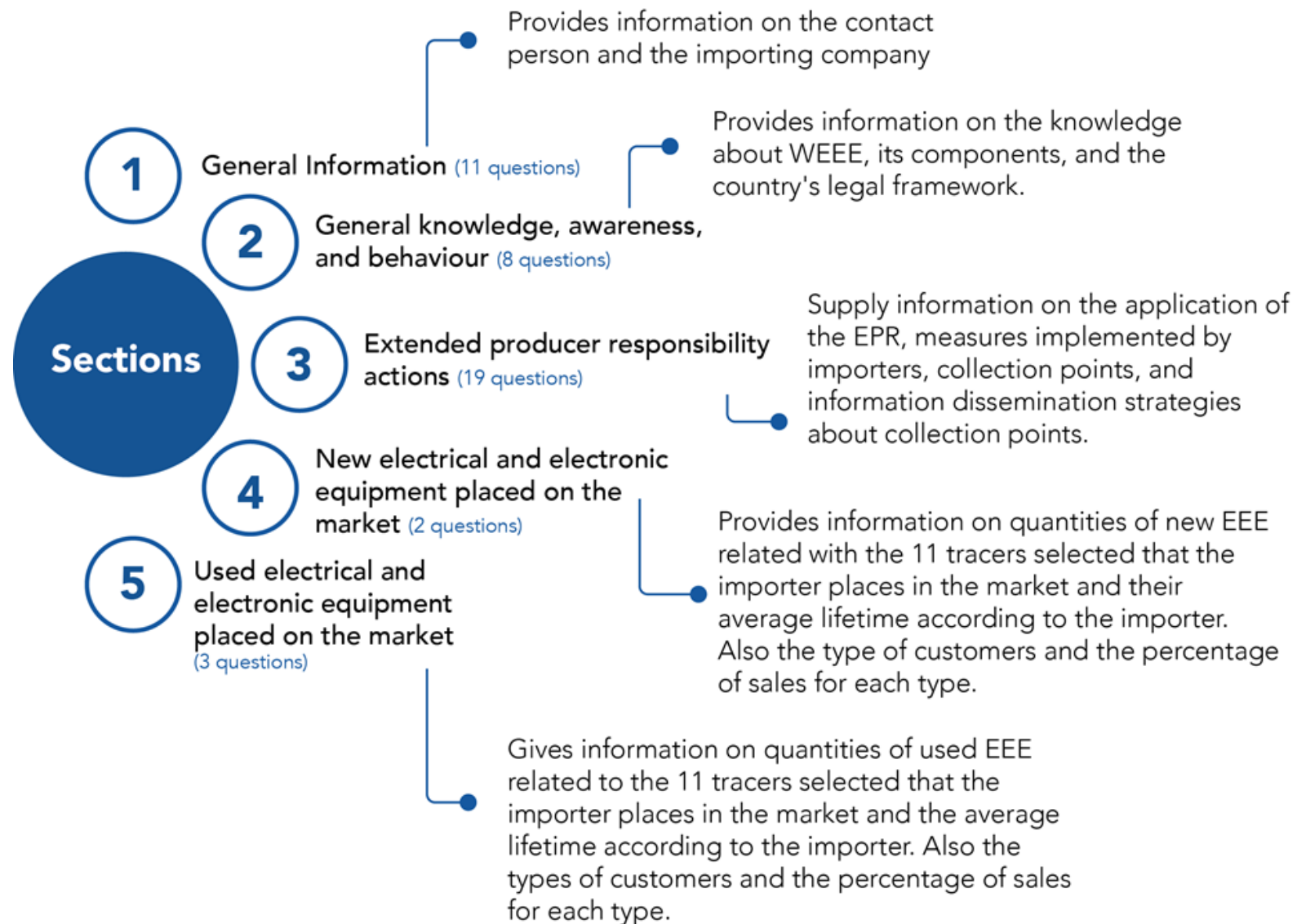
Phase 1

Assessment of the amount of EEE used or stored by consumers based on studies or surveys. Individual consumers (households), as well as institutional and professional consumers are considered.

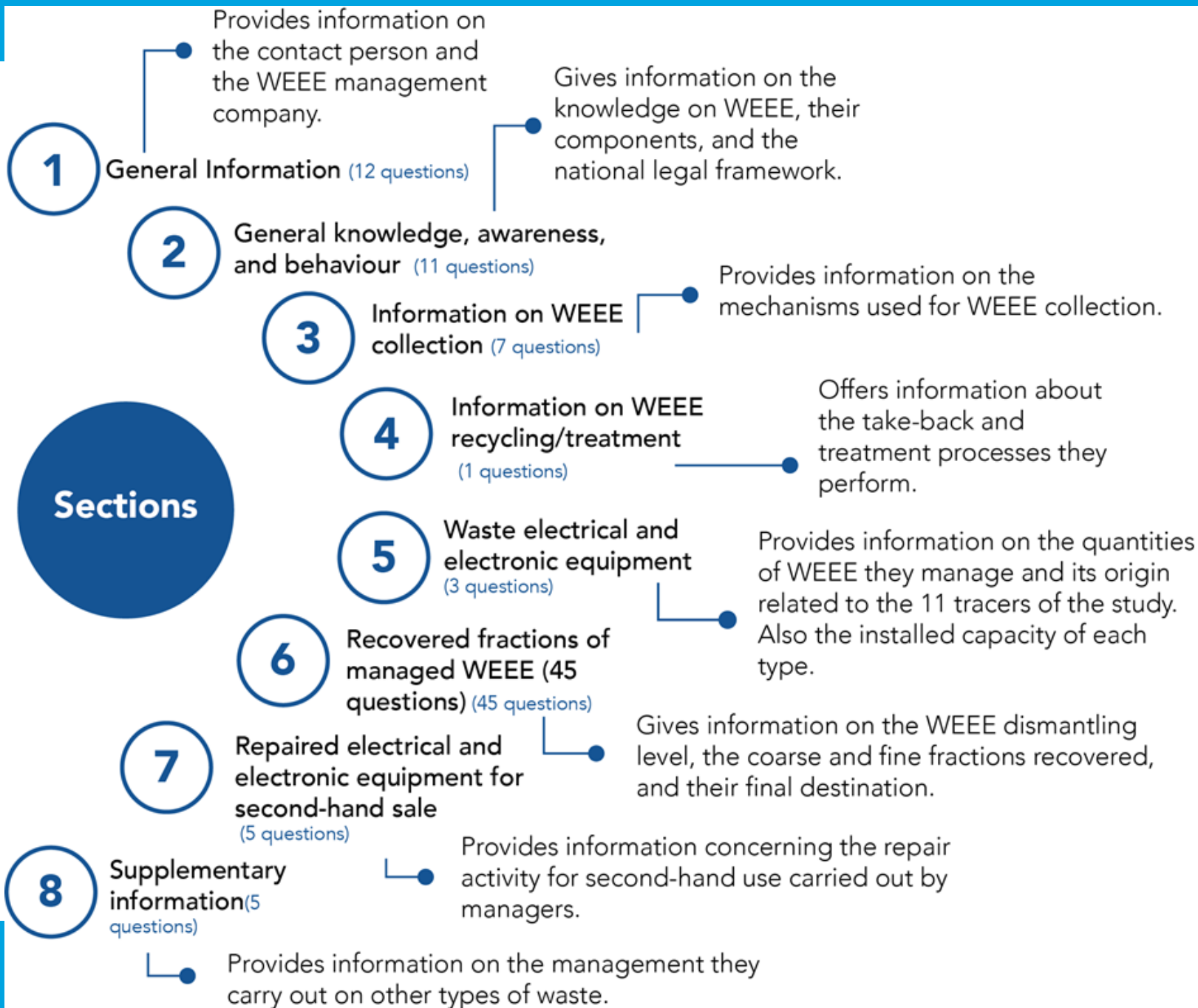
Phase 2

Estimation of e-waste generated obtained from surveys information.

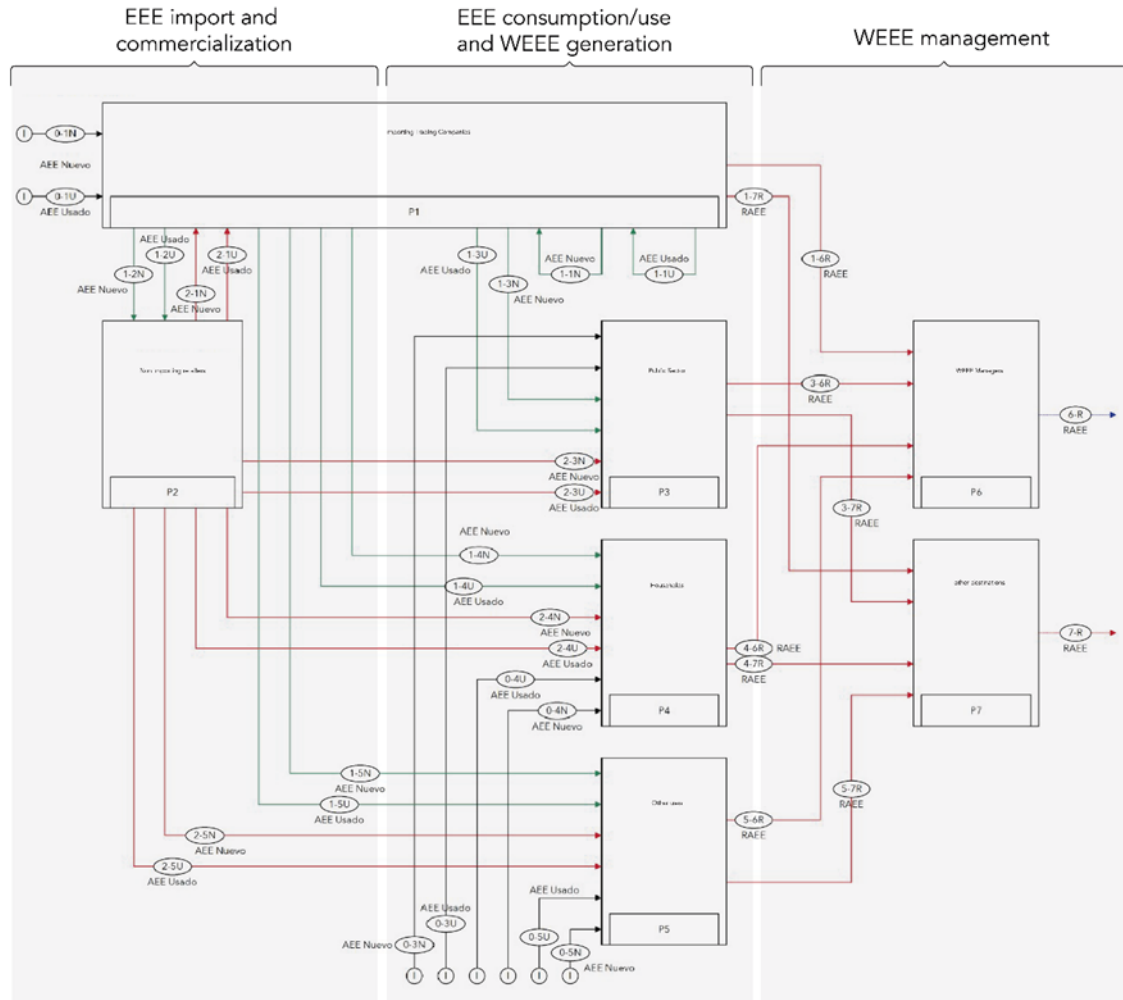
# Survey for EEE importers



# Survey for WEEE managers



# Baseline study system for Costa Rica, 2020



EEE import and commercialization	Consumption/use of EEE and WEEE generation	WEEE management
P1 – Trading Companies Importers and Private Sector P2 – Non importing retailers	P1 - Trading Companies Importers and Private Sector P3 - Public sector P4 – Households P5 - Other	P6 - WEEE managers P7 - Other destinations

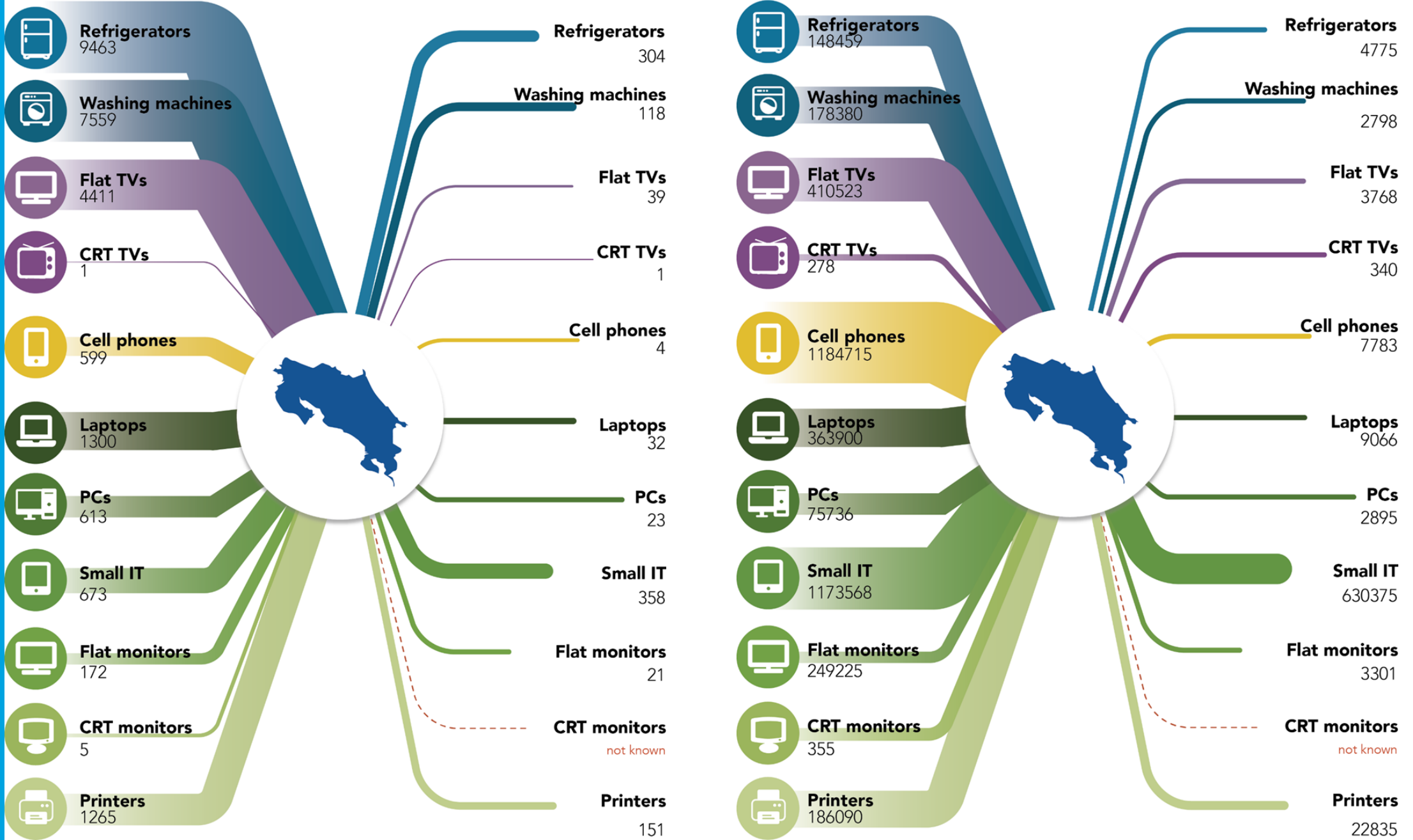
- N** New
  - U** Used
  - W** Waste
  - I** Import
  - P** Process
- Flows directly taken from imports base
  - Flows without information
  - Flows calculated using customs data and the study
  - Flows generated in study framework
  - O** Imports initial flow
  - Processes

**IMPORT**  
apparent  
consumption | tons/year  
2020

**WEEE MANAGED**  
sample project ITU

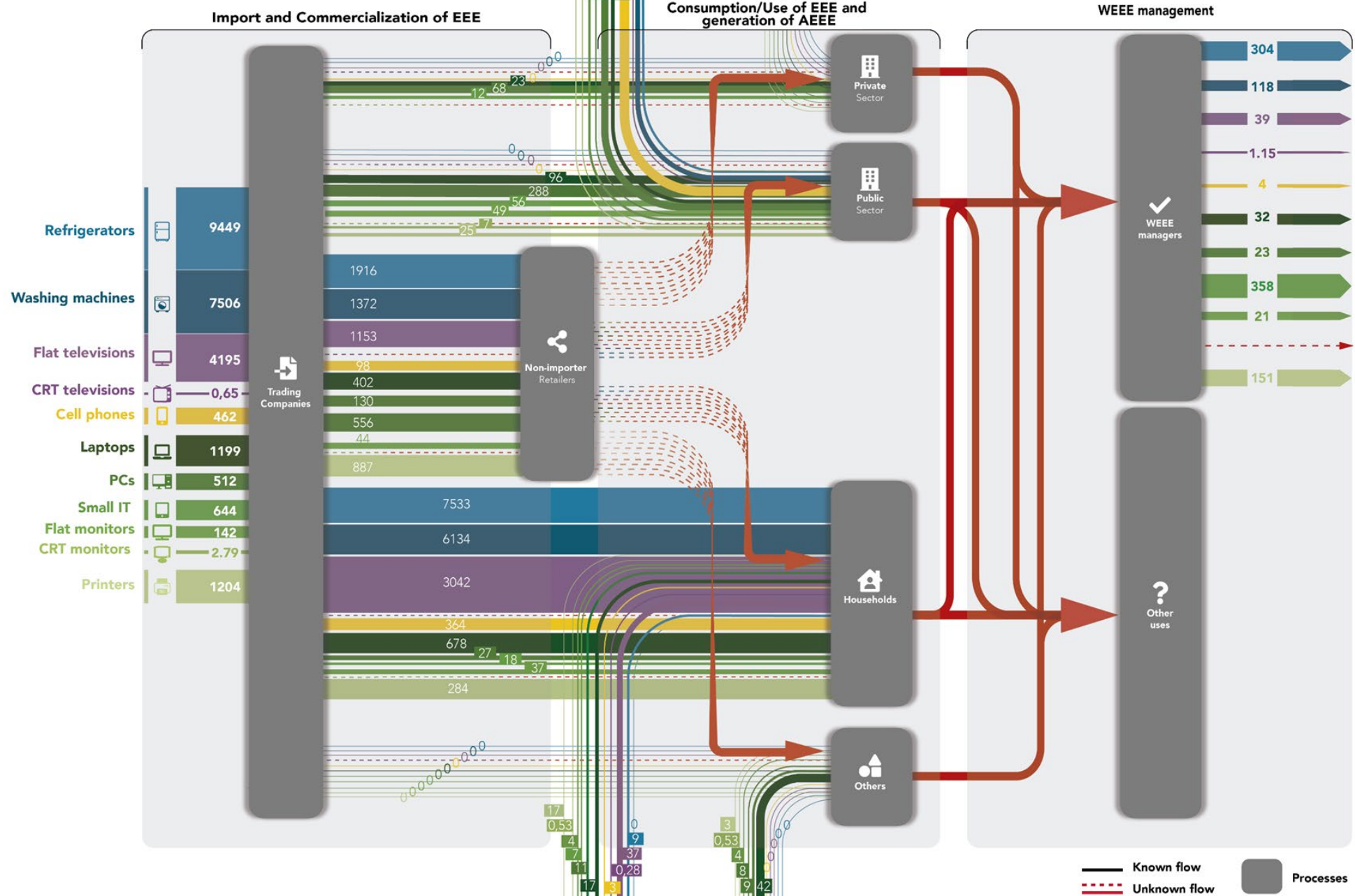
**IMPORT**  
apparent  
consumption | units/year  
2020

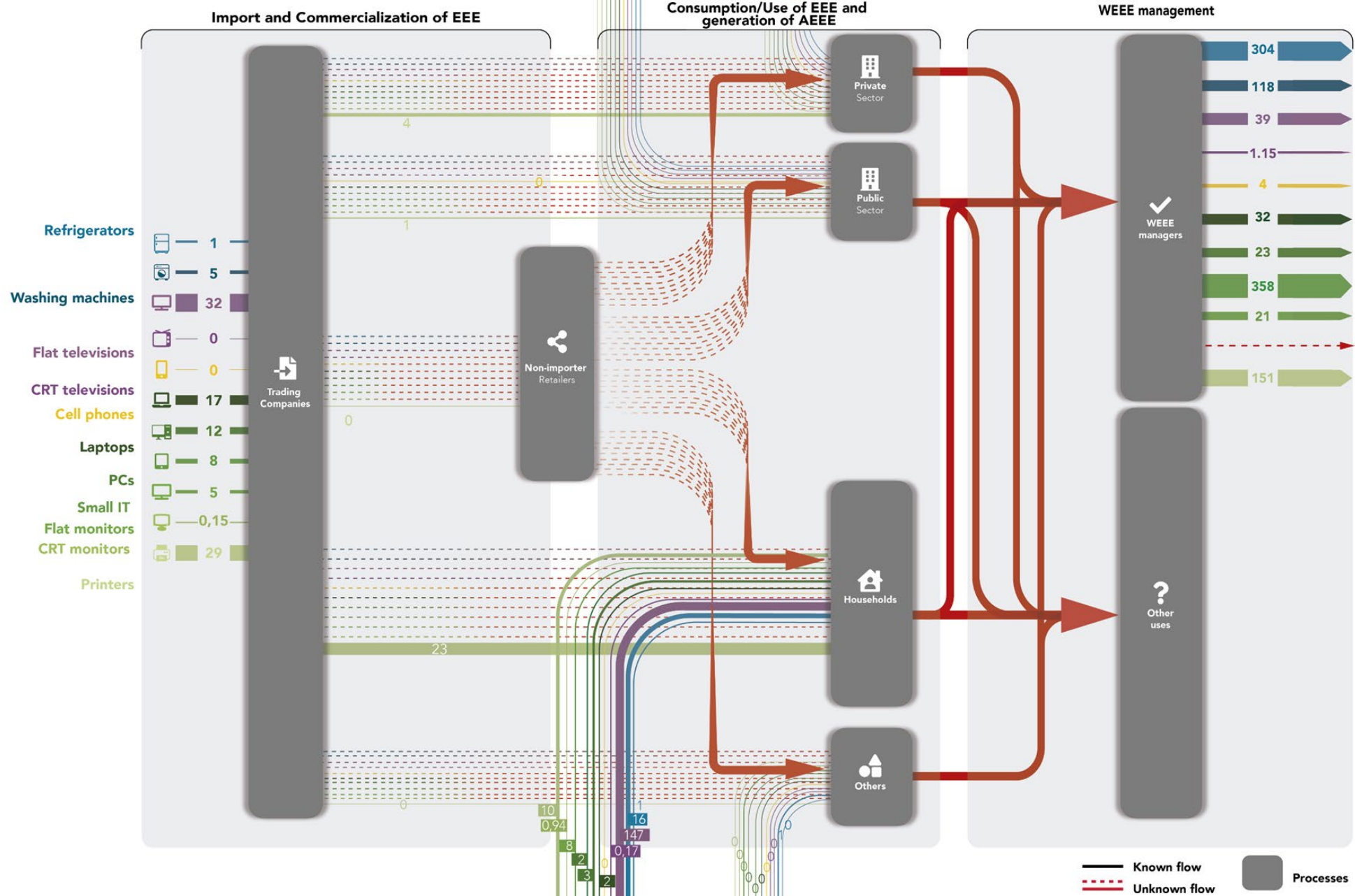
**WEEE MANAGED**  
sample project ITU



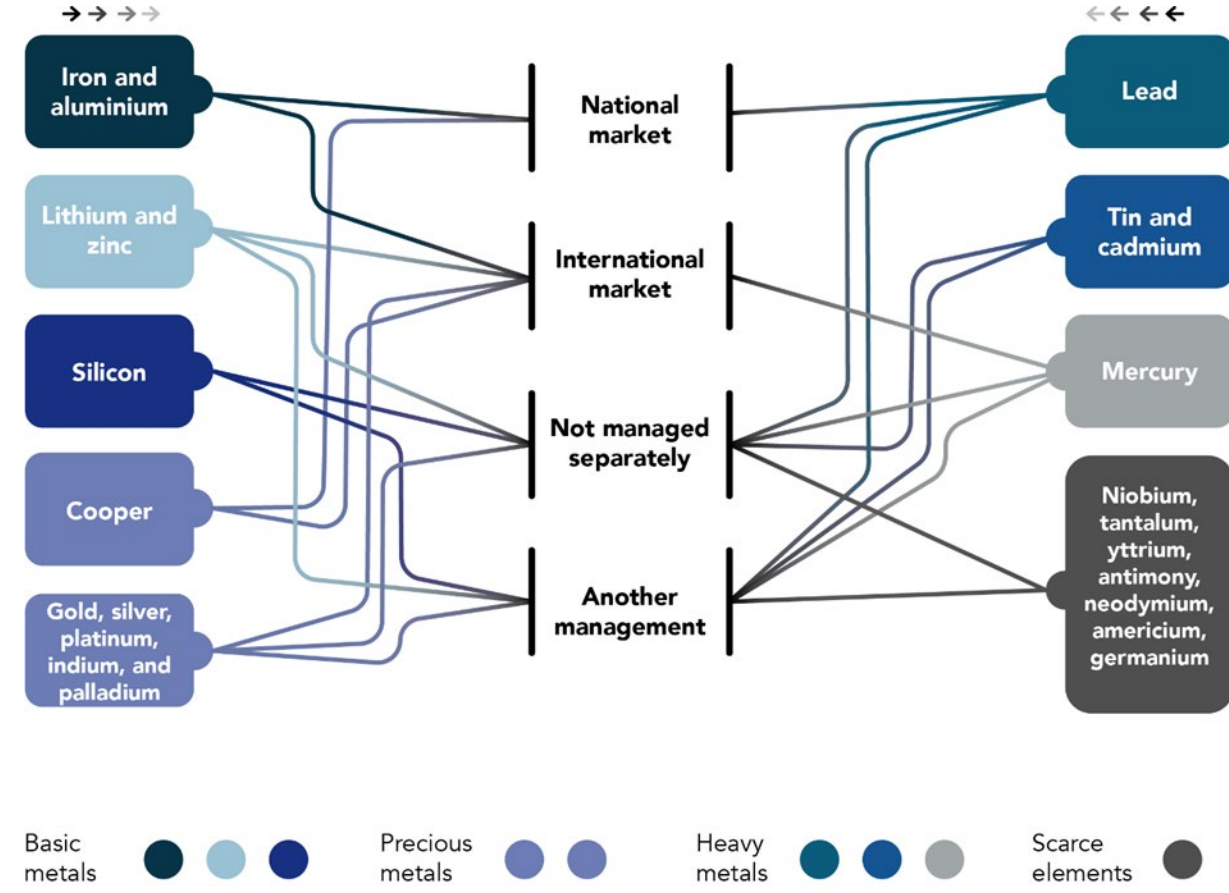
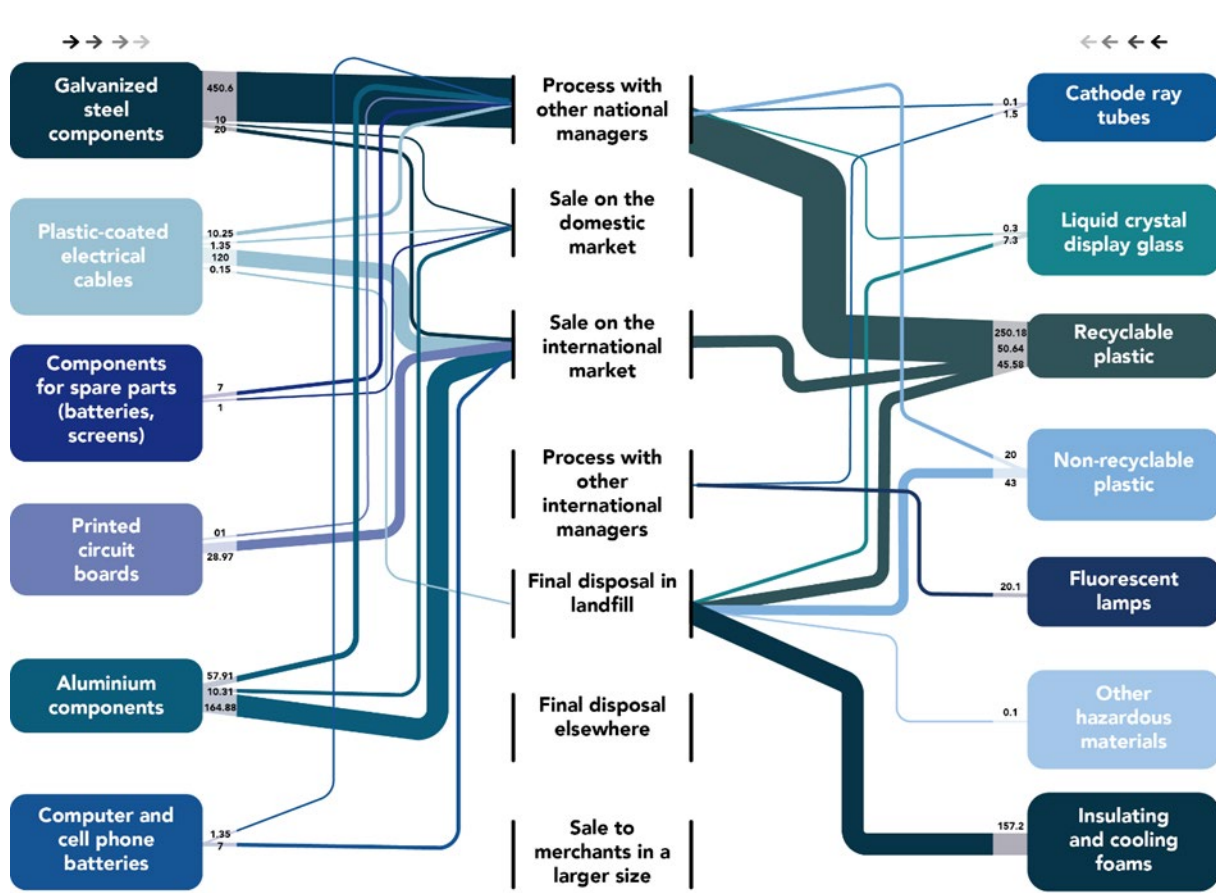
# COSTA RICA 2020

DIAGRAM OF MATERIAL FLOWS AND BALANCES OF NEW EEE (in tonnes)





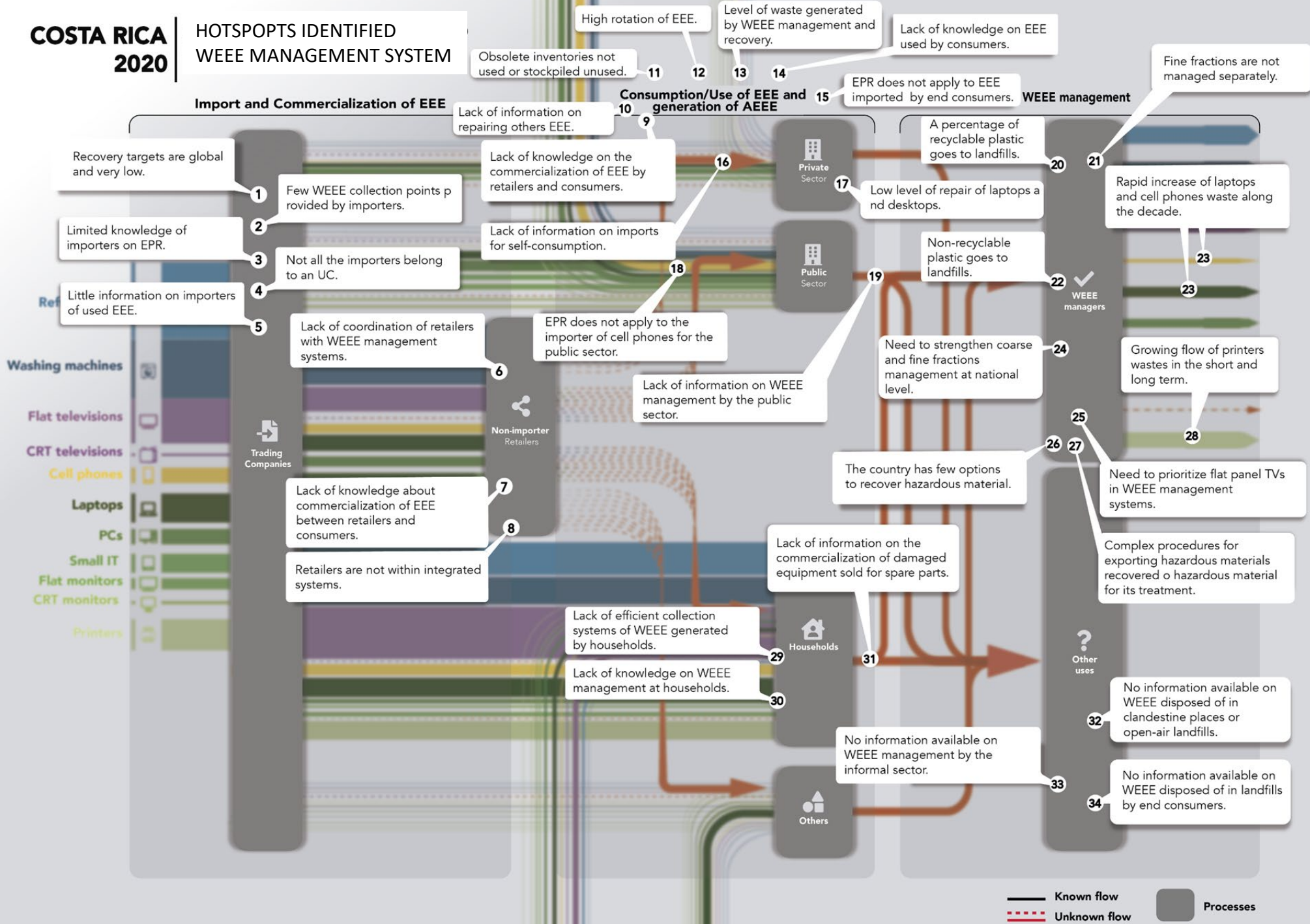
# Coarse and fine fraction flows



Basic metals ● ● ● Precious metals ● ● Heavy metals ● ● ● Scarce elements ●



**HOTSPOTS IDENTIFIED  
WEEE MANAGEMENT SYSTEM**



# Implementation of Recommendation ITU-T L.1032

International Telecommunication Union


**ITU-T** **L.1032**  
TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU (08/2019)

SERIES L: ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

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**Guidelines and certification schemes for e-waste recyclers**

Recommendation ITU-T L.1032



## Costa Rican legislation and Recommendation ITU-T L. 1032

Recommended measures in ITU-T L.1032 Recommendation	Executive Decree 41052 Take Back Centres for Waste Recovery Regulations	Ministerial Directive N° DM-CB-8016-2016 Technical Guide for the Integral Management of Electronic and Electrical Waste
Adequate ventilation	no	no
Air pollution control (Fine particles and dust)	no	no
Solid waste management	✓ Comply with ED 37567	no
Hazard waste management	✓ Comply with ED 41527	no
Liquid waste treatment	✓	no
Slag Management	no	no
Spillage containment measures (spillage management kit)	✓ Comply with ED 4152	no
Adequate tools and equipment	no	✓
Basic personal protection equipment (PPE)	no It is in DE 1 and 11492	✓
Fire extinguishers	✓ Comply with ED 25986	no
Training	✓	no
First aid kit	✓ Comply with ED 13466	no
Equipment to deal with heavy metals incidents	no	no
Special PPE to manipulate substances	no	✓
Showers	✓	no
Laundry	no	no
Management system	✓	no
Certifications	✓ Mandatory INTE-ISO 14001:2015 or INTE GB:2012	no

ED stands for Executive Decree

**Mandatory regulations referred to in the Executive Decree on Waste Recovery Centres Regulation:**

1 Executive Decree 37567 – General Regulations on the Integrated Waste Management Law

2 Executive Decree 41527 - Classification and Management of Hazardous Waste Regulations

3 Executive Decree 1 - Occupational Health and Safety Regulation

4 Executive Decree 11492 - Industrial Hygiene Regulations

5 Executive Decree 13466 - Occupational Hazards Regulations

6 Executive Decree 2598 – Technical Regulations Standard RTCR 226: 1997 Portable Fire Extinguishers

**Number of managers by type of process they carry out to recover components and materials they take-back from WEEE**

Fractions	Processes					
	Classification and separation	Smelting	Stripping	Refinement	Treatment previous to final disposal	Shredding
Recovered glass LCD screens	5					
Cathode ray tubes	5					
Plastics with flame retardants	4	1				
Recyclable plastic	5					2
Non-recyclable plastic	5					
Printed circuit boards	4	1	1	1		1
Fluorescent lamps contained in the EEE	4				1	
Insulating and cooling foams	4				1	
Components for spare parts	4					1
Aluminum components	5			1		1
Galvanized steel components	5					1
Electric cables	5	1		1		1
Computers and cell phones batteries	5					

# Focus group for managers' situation analysis

Activities			Objectives	Tools
1 Health impacts	3 Environmental impacts	5 Management systems	To know participants' understanding of health impacts, environmental impacts, and management systems.	Word cloud
2 Health and safety measures in place	4 Environmental measures implemented	6 Elements of management systems in use		
7 Perception of the conditions to implement ITU-T Recommendation L-1032 or INTE G8 or INTE-ISO 14001 standards			To get information on the environmental, health, and safety measures as well as certifications that managers have in place.	Questionnaire
			To know managers' perceptions of the challenges to implement ITU-T Recommendation L.1032 and INTE G8:2013.	Brainstorming

Block 1

Block 2

Block 3

Block 4

# Focus Group's results

Occupational health and safety measures	Environmental measures	Management systems, certifications
<ul style="list-style-type: none"><li>– They have basic PPE (safety goggles, cut-resistant gloves, masks and safety shoes).</li><li>– All facilities are equipped with fire extinguishers.</li><li>– All managers have first aid equipment.</li></ul>	<ul style="list-style-type: none"><li>– Only one of them has a dust collection system.</li><li>– They carry out dry sweeping.</li><li>– Two managers dispose of hazardous waste in landfill or municipal collection.</li></ul>	<ul style="list-style-type: none"><li>– Larger managers have certifications in safety, environment, quality or integrated systems based on ISO standards.</li><li>– Risk assessment, environmental aspects, compliance and environmental performance indicators.</li><li>– Managers classified as SMEs are at a clear disadvantage in terms of this compliance..</li></ul>

## **Managers' perceptions: Challenges in implementing Recommendation ITU-T L.1032 and management standards**

- They have environmental management systems and in some cases INTE-ISO 14001:2015 certifications.
- The costs and investments associated with environmental management systems and certifications are some of the aspects they perceive as the most difficult.
- Investment in equipment to comply with environmental and safety measures is identified as an obstacle.
- Difficulties in achieving a culture related to environmental management systems among workers.

# Challenges and improvement opportunities to strengthen SINAGIRE in Costa Rica





## Challenges facing Costa Rica

- Strengthen SINAGIRE by a mechanism which allow companies and institutions that import EEE for their own consumption to properly manage WEEE.
- Educate end consumers on the sustainable management of WEEE, making them aware of the environmental, social and economic impacts that the incorrect management of WEEE entails.
- Strengthen the installed capacity for WEEE management:
  - Companies outside the GAM, precious metal refining, fraction recycling, hazardous waste treatment..
- To carry out periodic and permanent data processing to evaluate SINAGIRE and updating EEE and WEEE inventories, flows and material balances.

## Improvement opportunities identified for SINAGIRE in Costa Rica

- Connect the computer systems of the General Directorate of Customs and the Ministry of Health.
- Implement online reporting by managers and compliance units.
- Incorporate a provision in the national legislation to allow the Ministry of Health to request information from importers.
- Develop a strategy to obtain information on EEE recyclers who use their EEE fractions for spare parts, as well as EEE repairers, used EEE sellers and informal managers.
- Expand the questions on EEE ownership and WEEE management in the National Household Survey (ENAHO), incorporating quantities and destinations.

## Improvement opportunities identified for SINAGIRE in Costa Rica (cont')

- Collect information on the EEE inventory in public sector institutions.
- Establish recovery targets differentiated by type of EEE.
- Update the Technical Guide for integral management of waste electrical and electronic equipment with environmental, occupational health and safety measures.
- Develop a strategy to identify and accompany informal WEEE managers.
- Develop a training programme for WEEE managers containing topics on national regulations, WEEE sustainable management, environmental, occupational health and safety measures and the management system.

## Conclusions

- Covid-19 brought unexpected, accelerated and irreversible changes in the digital transformation, and will be recognised as a milestone in the digitalisation era.
- It is associated with the production of EEE to meet current needs. WEEE generation is a related issue, whose sustainable management has been one of the biggest ICT sector challenges and will increase in the post-pandemic era.
- As an importer and consumer of EEE, Costa Rica has made efforts to develop sustainable management of material flows at the national level, including WEEE.

## Conclusions (cont')

- The implementation of ITU-T L.1031 and ITU-T L.1032 standards will allow Costa Rica to improve its existing system, as hotspots and specific opportunities for improvement have been identified, which can be addressed in the short and medium term.
- The information gathered will allow to establish public policies, strengthen national legislation, establish recovery goals and evaluate the national system.
- Costa Rica must strengthen open data policies to guarantee the sustainability of the national system, its updating and the possibility of providing the reports requested by international organisations.



**Thanks!**