Unlocking Circularity, Transparency, and Market Opportunity educing: the role of International Standards

How ITU is supporting a transition to a circular economy

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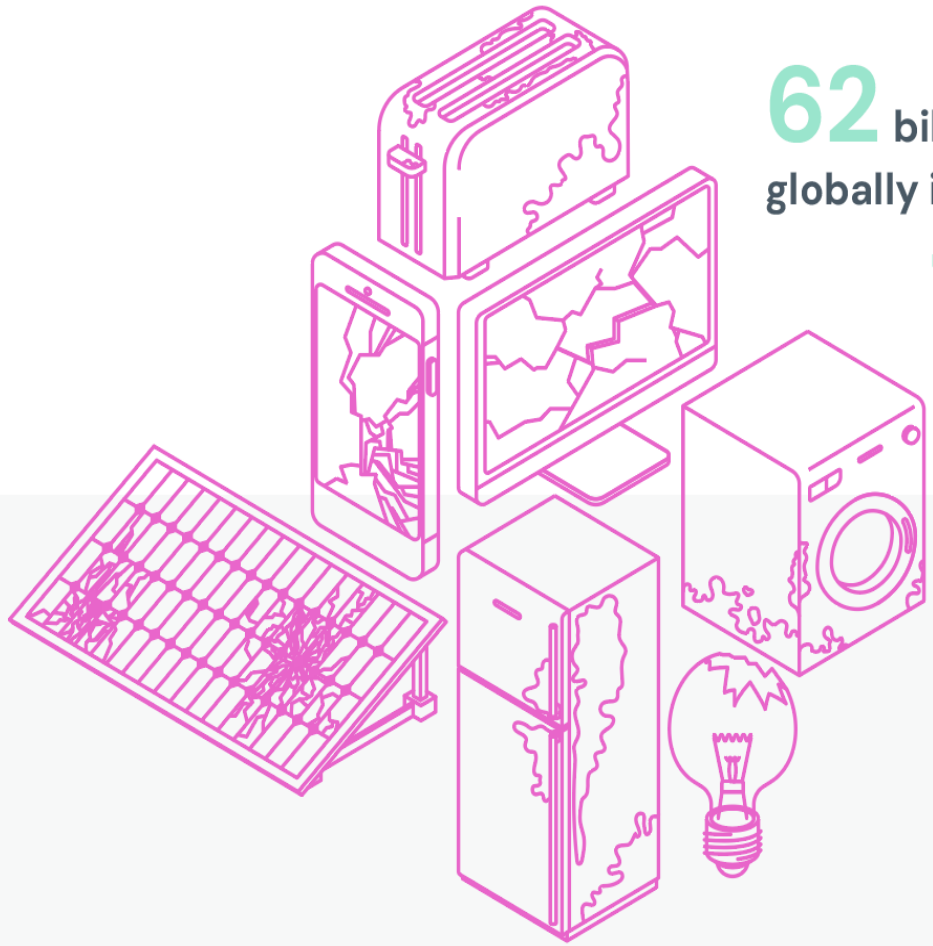
Supporting the transition to circularity in the ICT sector

Because small actions create big impact — every device counts.



62 billion kg of e-waste generated globally in 2022.

7.8 kg per capita.

22.3% of this e-waste was documented as formally collected and recycled in an environmentally sound manner.

Source: The Global E-waste Monitor 2024

ITU-T Standards on E-waste, the Impact of ICTs and the Circular Economy

Frameworks and Guidelines

- ITU-T L.1021: Extended producer responsibility - Guidelines for sustainable e-waste management
- ITU-T L.1030: E-waste management framework for countries
- ITU-T L.1031: Guideline for the development of an e-waste management system and achieving the e-waste targets of the Connect 2030 Agenda
- ITU-T L.1032: Guidelines and certification schemes for e-waste recyclers
- ITU-T L.1033: Guidance for institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste
- ITU-T L.1037: Requirements for the collection, transportation, storage, dismantling, valorization and final disposal of WEEE
- ITU-T L.1050: Methodology to identify key equipment for environmental impact and e- waste generation assessment of network architectures
- ITU-T L.Suppl. 4: Guidelines for developing a sustainable e-waste management system
- ITU-T L.Suppl.27: Supplement on success stories on e-waste management

Reduction

- ITU-T L.1000-1007 Series: Universal power adapter (UPA) and charger solution for ICT devices
- ITU-T L.1018: Specification for the durability assessment of mobile telecommunication terminals
- ITU-T L.1023: Assessment method for circularity performance scoring
- ITU-T L.1024: The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global ICT
- ITU-T L.1028: Evaluating the global-warming-potential impact of extending the operating lifetime of ICT equipment
- ITU-T L.1036: Scheduled waste management for a base station (inclusive of e-waste)
- ITU-T L.1040: Effects of ICT-enabled autonomy on vehicles longevity and waste creation
- ITU-T L.1080: Assessment of material efficiency of ICT network infrastructure goods (circular economy); Part 3 Server and data storage product availability of firmware and of security updates to firmware
- ITU-T L.Suppl.47: Examples of resource saving within the ICT sector

Recycling

- ITU-T L.1025: Assessment of material efficiency of ICT network infrastructure goods (circular economy); Server and data storage product secure data deletion functionality
- ITU-T L.1027: Assessment of material efficiency of ICT network infrastructure goods (circular economy) – Server and data storage product disassembly and disassembly instruction
- ITU-T L.1032: Guidelines and certification schemes for e-waste recyclers
- ITU-T L.1035: Sustainable management of batteries
- ITU-T L.1037: Requirements for the collection, transportation, storage, dismantling, valorization and final disposal of WEEE
- ITU-T L.1081: Good practices for the sanitization of the information storage media in end-of-life ICT user devices
- ITU-T L.1100: Procedure for recycling rare metals in ICT goods
- ITU-T L.1101: Measurement methods to characterize rare metals in ICT goods
- ITU-T L.1102: Use of printed labels for communicating information on rare metals in ICT goods

ITU-T Standards on E-waste, the Impact of ICTs and the Circular Economy

Batteries

- ITU-T L.1010: Green battery solutions for mobile phones and other hand-held ICT devices
- ITU-T L.1011: Guidelines for the durability assessment of Lithium-ion Batteries
- ITU-T L.1035: Sustainable management of batteries

Environmental Assessment

- ITU-T L.1015: Criteria for evaluation of the environmental impact of mobile phones
- ITU-T L.1016: Method for evaluation of the environmental health and safety performance of true wireless stereo headphones
- ITU-T L.1017: Environmental performance scoring of smartphones
- ITU-T L.1018: Specification for the durability assessment of mobile telecommunication terminals
- ITU-T L.1400: Overview and general principles of methodologies for assessing the environmental impact of ICTs
- ITU-T L.1410: Methodology for environmental life cycle assessments of ICT goods, networks and services

Circular Economy

- ITU-T L.1020: Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks
- ITU-T L.1022: Circular economy: Definitions and concepts for material efficiency for ICT
- ITU-T L.1023: Assessment method for circularity performance scoring
- ITU-T L.1024: The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global ICT
- ITU-T L.1025: Assessment of material efficiency of ICT network infrastructure goods (circular economy); Server and data storage product secure data deletion functionality
- ITU-T L.1027: Assessment of material efficiency of ICT network infrastructure goods (circular economy) – Server and data storage product disassembly and disassembly instruction
- ITU-T L.1080: Assessment of material efficiency of ICT network infrastructure goods (circular economy); Part 3 Server and data storage product availability of firmware and of security updates to firmware
- ITU-T L.Suppl.28: Circular economy in ICT; definition of approaches, concepts and metrics
- ITU-T L.Suppl.47: Examples of resource saving within the ICT sector

Digital Product Passport

- ITU-T L.1070: Global digital sustainable product passport opportunities to achieve a circular economy
- ITU-T L.1071: A model for digital product passport information on sustainability and circularity
- ITU-T LSTR.CONF-to-L.1071: Guidance on conformity assessment of ICT goods/products to standards according to ITU-T L.1071/ETSI ES 204 082

ITU-T Standards on E-waste, the Impact of ICTs and the Circular Economy

User Device Sustainability Solutions

- ITU-T L.1000-1007 Series (excluding L.1003): Universal power adapter (UPA) and charger solution for ICT devices
- ITU-T L.1010: Green battery solutions for mobile phones and other hand-held ICT devices
- ITU-T L.1011: Guidelines for the durability assessment of Lithium-ion Batteries
- ITU-T L.1015: Criteria for evaluation of the environmental impact of mobile phones
- ITU-T L.1017: Environmental performance scoring of smartphones
- ITU-T L.1018: Specification for the durability assessment of mobile telecommunication terminals
- ITU-T L.1040: Effects of ICT-enabled autonomy on vehicles longevity and waste creation
- ITU-T L Suppl. 32: Supplement for eco-specifications and rating criteria for mobile phones eco-rating programmes

Stakeholder Engagement and Awareness

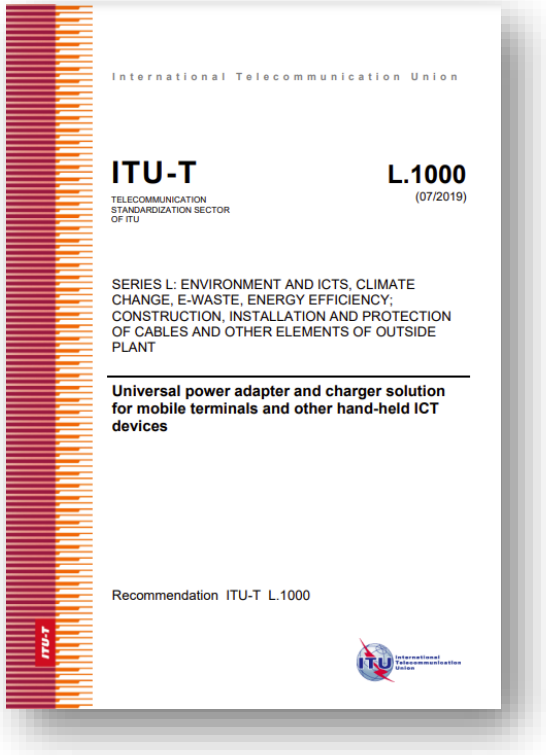
- ITU-T L.1033: Guidance for institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste
- ITU-T L.1034: Adequate assessment and sensitization on counterfeit ICT products and their environmental impact

Supply Chain

- ITU-T L.1024: The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global ICT
- ITU-T L.1060: General principles for the green supply chain management of ICT manufacturing industry
- ITU-T L.1061: Circular public procurement of information and communication technologies
- ITU-T L.Suppl.20: Green public ICT procurement

Tackling the E-Waste Challenge

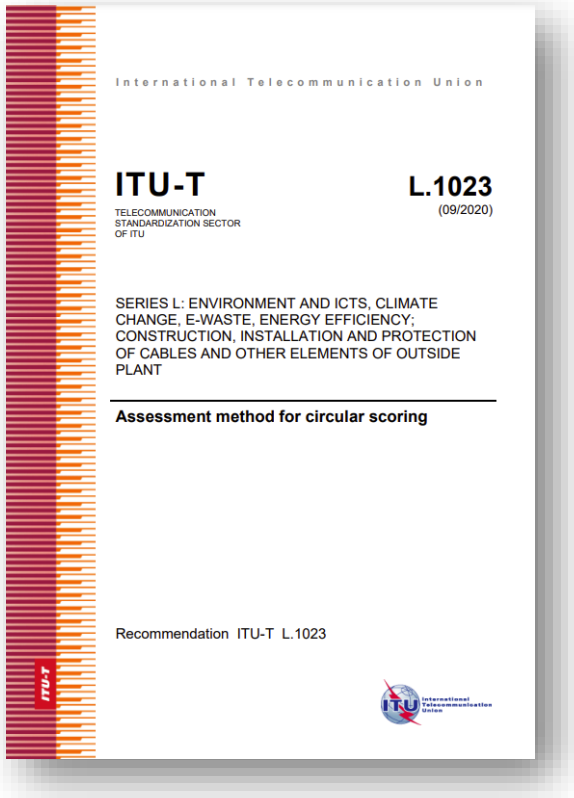
Reducing production and disposal of new chargers is estimated to reduce the amount of electronic waste by 980 tonnes yearly



Recommendation ITU-T L.1000:
Provides requirements for universal chargers. Reducing the amount produced and recycled by widening their application to more devices and increasing their lifetime.

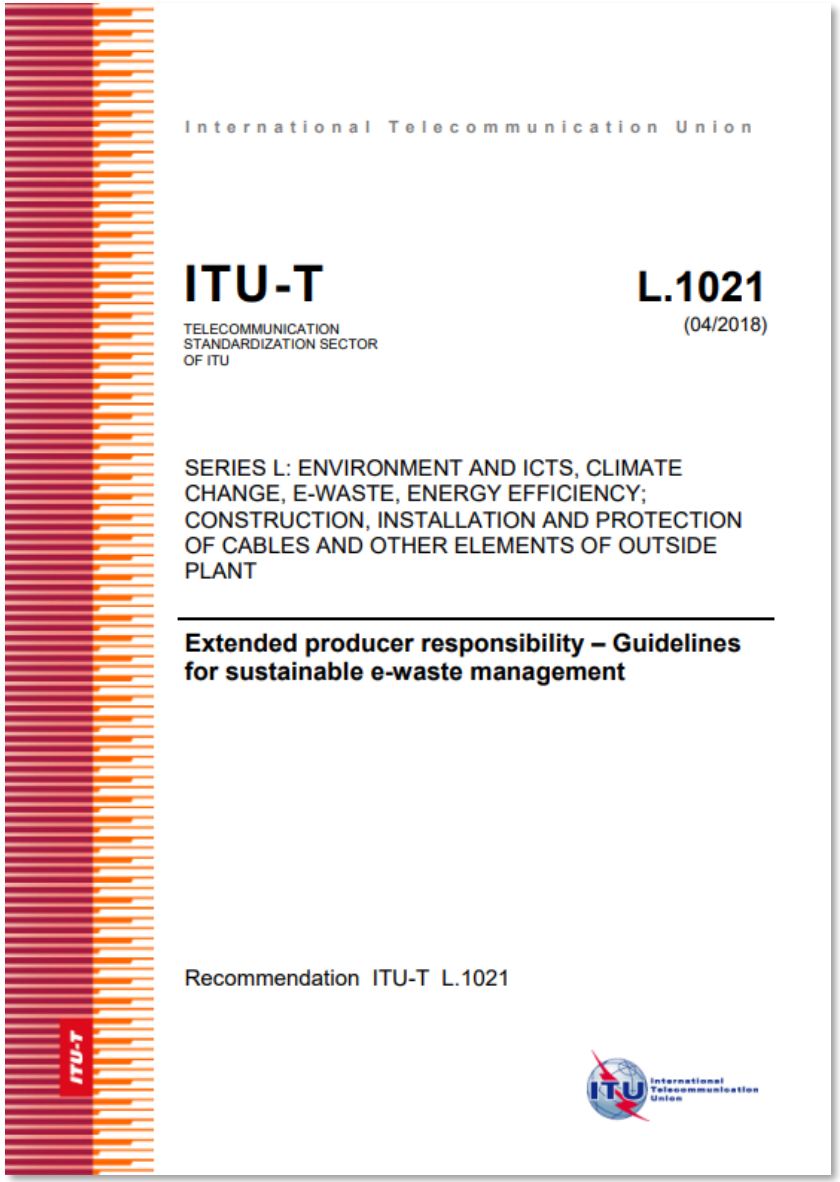
Driving the circular economy through standards

To achieve a sustainable future, transitioning to a circular economy is crucial.



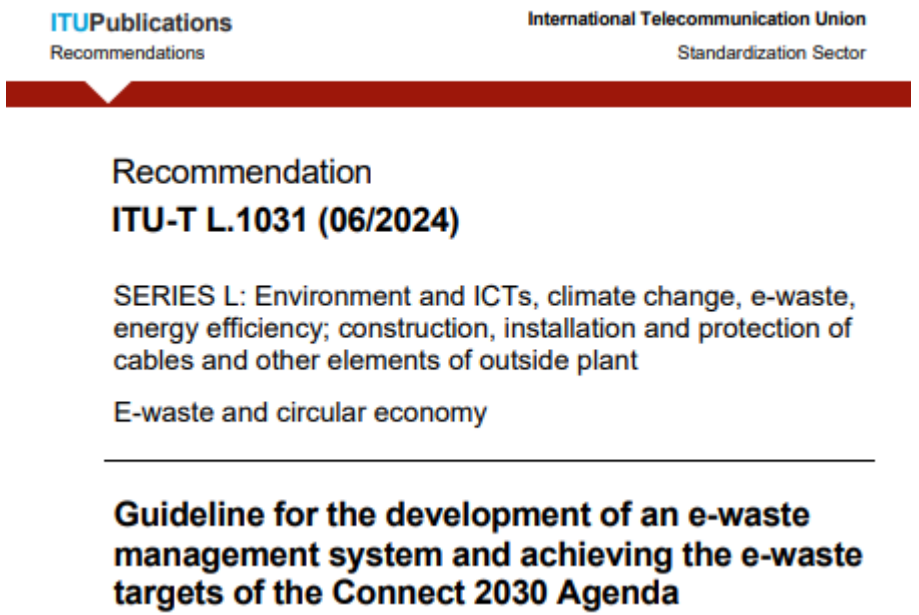
Recommendation ITU-T L.1023: Measures the circularity of products, guiding design towards sustainability.

Extended Producer Responsibility (EPR) is a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibility of the manufactures of the product to various parts of the entire life cycle of the product and especially to the take-back, recycling and final disposal of the product.



Recommendation ITU-T L.1031 is the result of the Connect 2030 Agenda and aligns with several sustainable development goals (SDGs).

This Recommendation specifies a three-step approach that relevant stakeholders can use to reach the e-waste goal of the Connect 2030 Agenda.

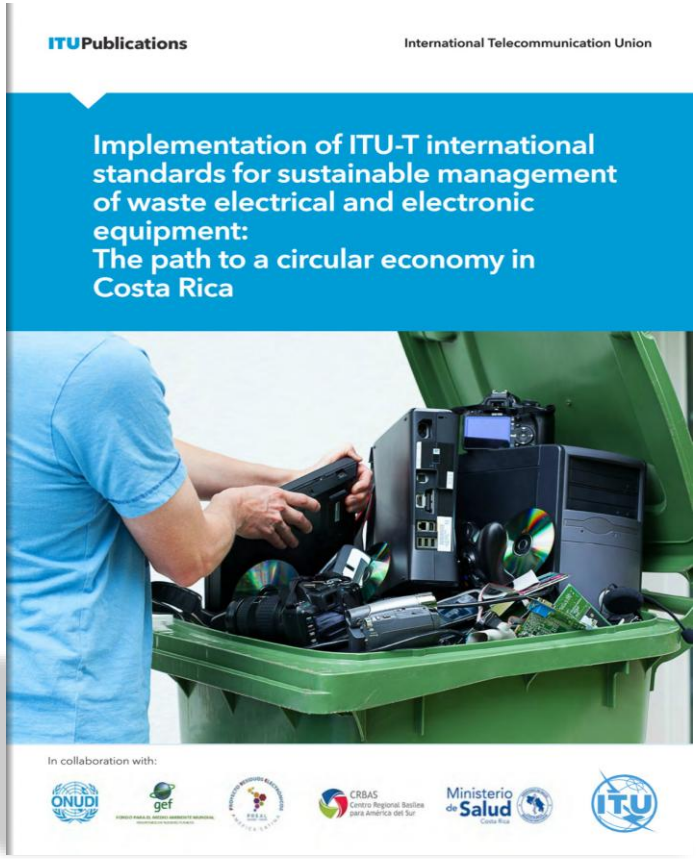


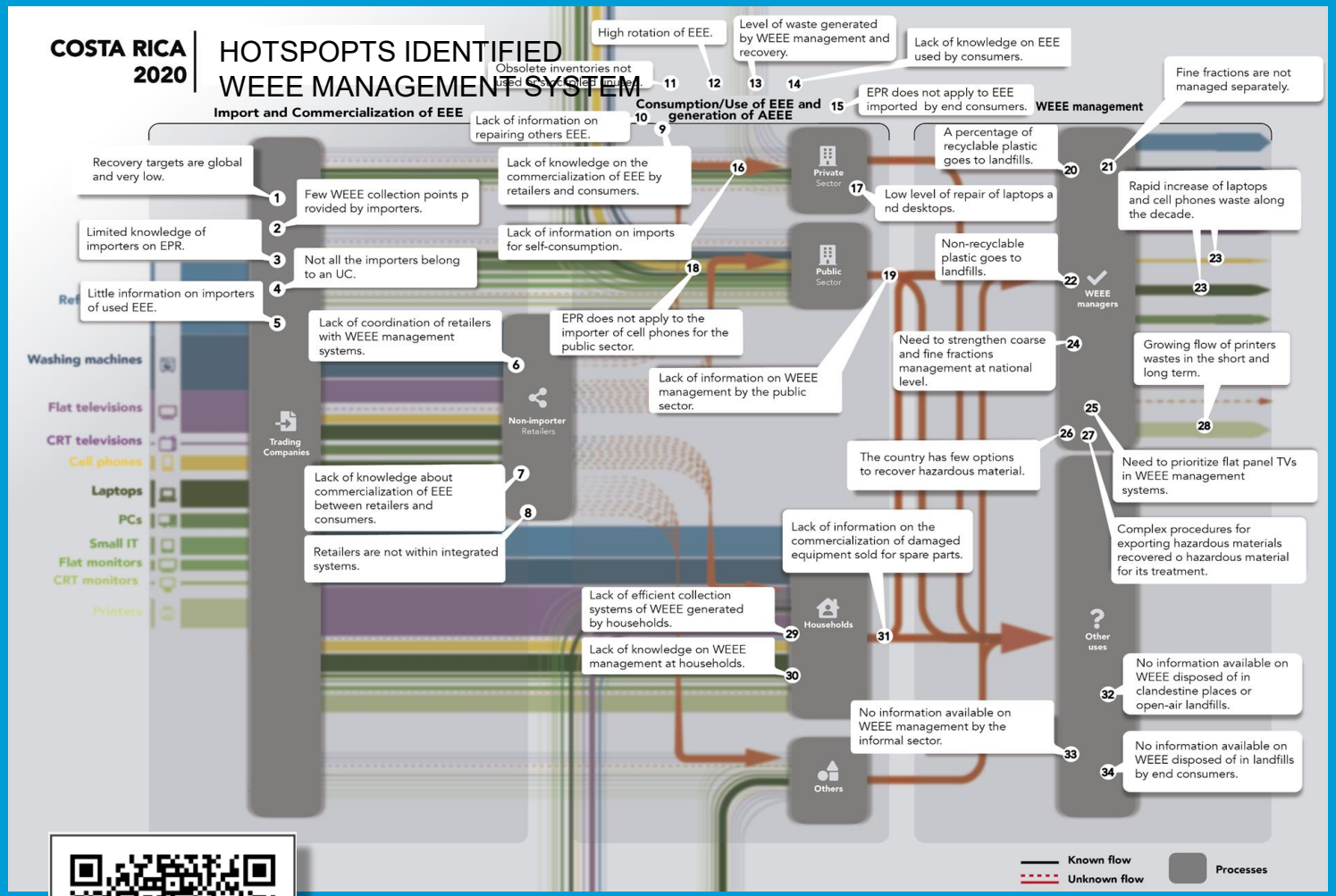
ITU-T L.1031: Guideline for the development of an e-waste management system and achieving the e-waste targets of the Connect 2030 Agenda

Three-step approach

Step 1	**Develop a comprehensive e-waste inventory**
Step 2	**Develop a sustainable e-waste management system**
Step 3	**Outline the requirements for successfully implementing e-waste programmes**

Supporting Countries to Make Better Decision Making About Waste





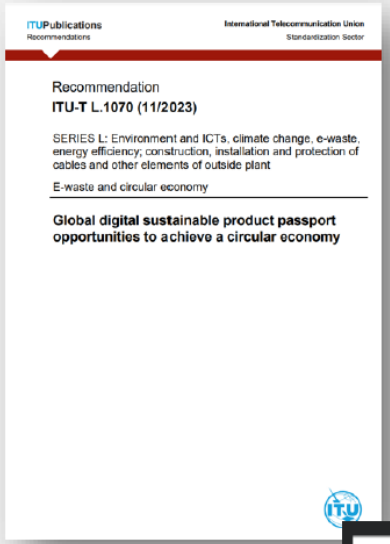
Digital Product Information Systems

- *ITU definition*

Digital Product Passports: Structured collection of product-specific data conveyed through a unique identifier.

Digital Product Passport Opportunities
ITU-T L.1070

Provides an overview of global and common opportunities to represent sustainability, mainly environmental-related, details about digital technology products


ITUPublications
Recommendations

International Telecommunication Union
Standardization Sector

Recommendation
ITU-T L.1070 (11/2023)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

E-waste and circular economy

Global digital sustainable product passport opportunities to achieve a circular economy

Digital Product Passport Information on sustainability and circularity
ITU-T L.1071

Provides a structured collection of information items organised to represent circularity and environmental sustainability information in accordance with relevant standards of ICT products for various actors during the product lifespan up to final recycling.

Benefits of these digital product information systems

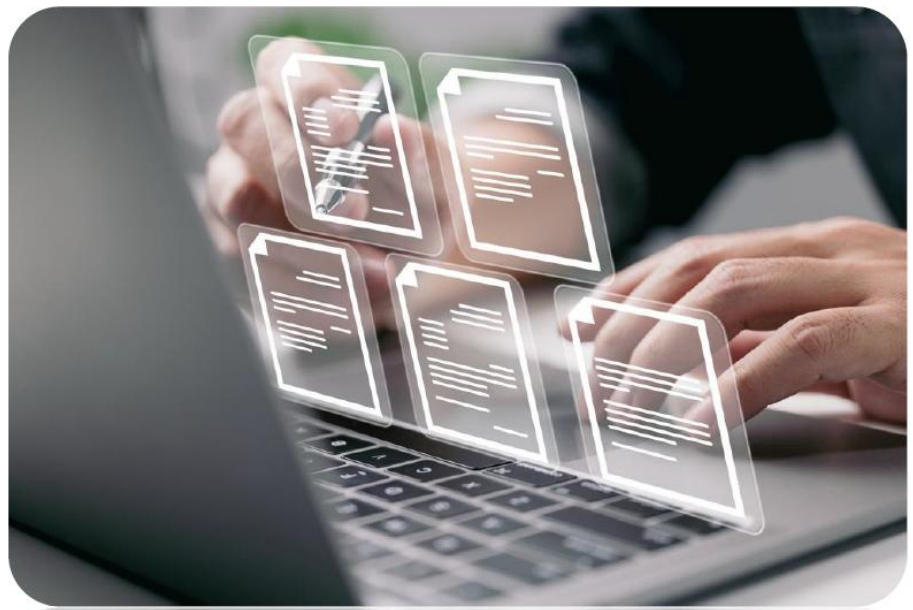
Reliable digital information related to environmental sustainability

- Characteristics and data sheets
- Manuals
- Guides

Circulation to contribute to the extended use

- Maintenance
- Repair
- Reuse
- Recycle

Responsible and verifiable recycling and management



Beneficiary users

- Facilitates the activities of product operators:
  - Manufacturers
  - Buyers
  - Owners
  - Repairers
  - Remanufacturers
  - Recyclers
  - National authorities
  - Auditors
- It could empower consumers with relevant information.
- It may have different content depending on the role and accreditation of the operator.

Information contained

- Materials
- Design
- Use, maintenance and repair instructions
- Ways to recover and disassemble components and recycle them
- Equipment life
- Energy consumption

Relevant useful information on

- Specifications
- Programming
- Firmware
- Software

Includes

- Raw materials (scarce, critical and secondary)
- Adverse social and environmental risks due to the presence of hazardous substances

Pays special attention

- Provide monitoring
- Facilitating procurement proceedings
- Reversed logistics
- Facilitate extended producer responsibility

Manufacturers

What is inside ITU-T L.1070?

Provides an overview of global and common opportunities to represent:

- sustainability, mainly environmental related (including human health),
- details about digital technology products:
  - Collective ICT product models
  - Batches
  - Individual product items.

Global scope for harmonization, i.e., relevant to any region

Example of information that could contain in the scope of regional and global conventions

- globally harmonized system for classification and labelling: categories, symbols and risk phrases for hazardous substances
- UN Numbers for hazardous substances
- Hazardous substances and materials SDSs
- Harmonized systems codes for trade categories of products and e-waste
- Basel Convention codes
- Transport codes
- Schemes for classification and labelling of raw and secondary materials
- Transport codes
- Schemes for classification and labelling of raw and secondary materials
- product conformity database
- Traceability registries.

Desirable principles

- Digitalization
- Data findability, accessibility, interoperability and reusability
- Usefulness
- Accuracy
- Inclusivity
- Transparency
- Accountability
- Standardization
- Information privacy
- Information protection

Data quality properties

- Accessibility
- Free access to relevant information
- Persistency
- Authenticity
- Identifiability
- Composability
- Integrity
- Verifiability
- Traceability (of products)

What is inside ITU-T L.1071?

Mapping of different terminology between EU ESPR and B2B DPP data model and propose a model for the information

Table 1. Mapping of environmental information in this Recommendation to the B2B DPP data model

Environmental sustainability information model	B2B DPP data model
environmental information item/instance	sustainability claim
informed value	claimed value
criteria source	criteria reference
reference value	benchmark value
source of the reference value	benchmark reference

Topic	*Standard or regulation*	*Criteria reference*	*Environmental information / Claimed values (Metric)*				*Conformity*					*Rationale*
Code/name from vocabulary	Source URI	Criteria URI	Name	Value	Unit	Accuracy	Reference/Benchmark value	Source for the reference value / Benchmark reference to evidence to value	Conformance indicator (boolean)	Expected evidence	Reference to conformity evidence	Description
Low halogen electronics: electronics.halogen	ITU-T L.1015	https://www.itu.int/rec/T-REC-L.1015/#PCB-chl	PCB and accessories, chlorine: electronics.halogen.chlorine	100	ppm	empty	900	https://x.int/standard-about-benchmark-value	true	Evidence PCB and accessories meet requirements	https://manufact.com/DPP1/electronics.chlorine	PCB and accessories < 900 ppm chlorine

Ongoing work

L.DPP4C - Consumer-oriented environmental information and reversed value chain information about ICT goods on digital product passports

- Will analyse the use of DDP to provide information to customers and how this information needs to be conveyed to consumers.
- Will define which product information is useful to be included in DPP with particular attention to the reverse value chains and how to present it.

Inputs are welcome

New Standard under development

L.DPIS - Guidelines for a modular and scalable data system design for Digital Product Information Systems (DPIS) for ICT goods

- Relevant data categories and subcategories, in order of importance.

- Support the design of DPIS approaches for ICT products, facilitating:
  - traceability,
  - circularity, and
  - informed decision-making across the product life cycle.

Data categories

- General product information
- Materials and composition
- Instructions and lifecycle information
- Environmental life cycle assessment
- Social life cycle assessment
- Compliance
- Circular Economy R-Strategies

Inputs are welcome

One planet connect with care | Sustainable Digitalisation

UN environment programme

ITU

Potential global benefit

- They can be linked and provide information on compliance with regulations and standards that can be digitally verified.
- It benefits all stakeholders and reduces the burden of making informed decisions to optimize and assess the sustainability of products.
- Harmonized global system for product information exchange that provides a balance between transparency and confidentiality, as well as privacy, security and verifiability.
- Discussion, consensus, standardization and legislative processes can enable agreements to develop concrete and specific specifications, including mandatory and voluntary values for countries (recommended or optional) in these systems.

Take action today!

Get involve in journey how to make the ICT sector more sustainable supporting digital transformation.

Think whether it is necessary to buy a new device, or you can continue using the existing one.

Manage your e-waste in a responsible way.

Think about recycling!

Make more circular consumer decisions

Share what you have learnt today about the importance of standards, digitalization and sustainability

Stay tunned on upcoming events

Thank you!

Email

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Website

SG5: Environment, climate change and circular economy