Digital Product Passport for ICT products

Paolo Gemma, WP2/5 Chair, ITU-T

17 October 2025

Setting the standard for sustainable digital transformation, globally

ITU-T Standardization Sector

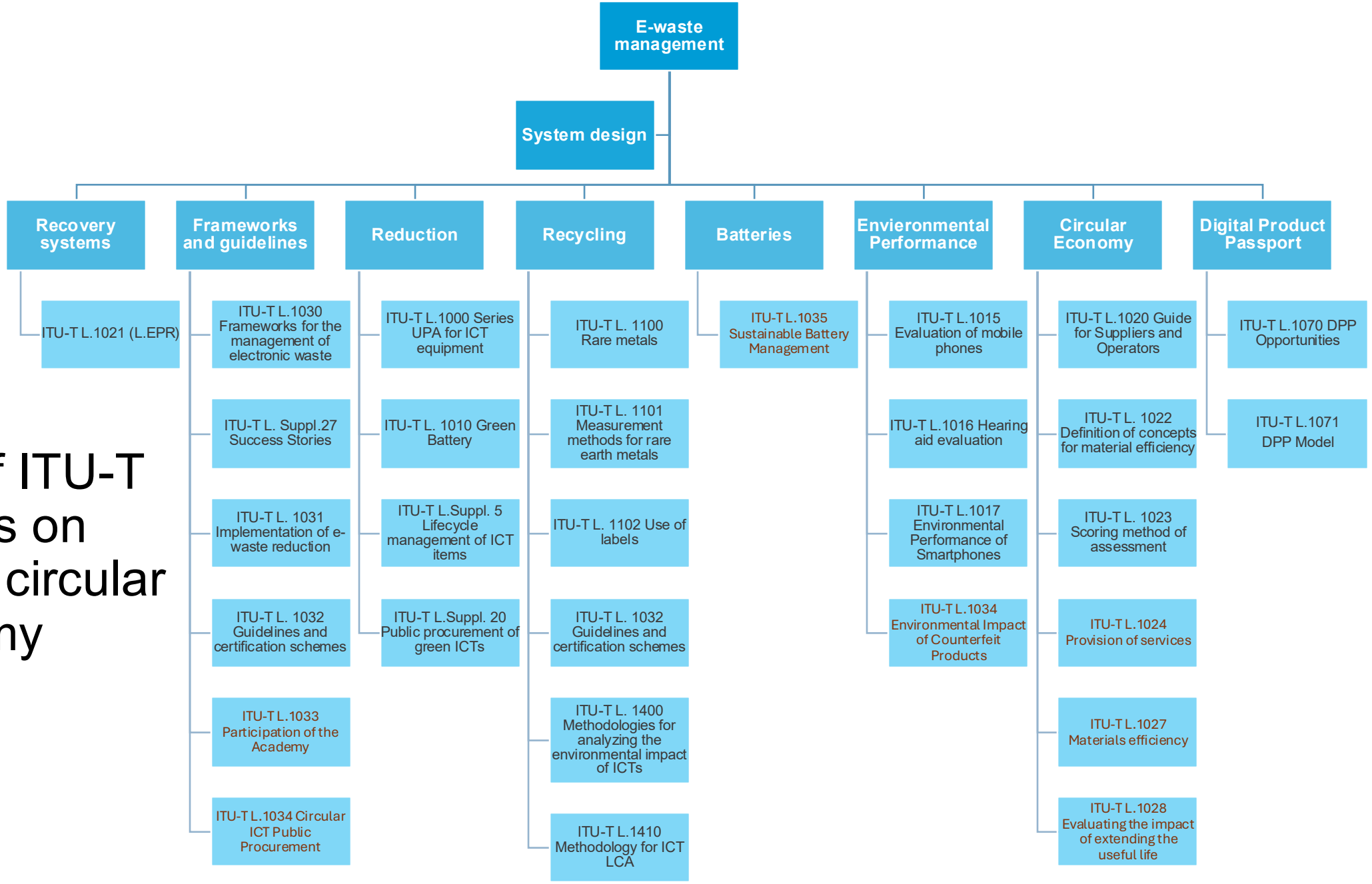
Sets international standards for sustainable digital transformation.

ITU-T Study Group 5

Environment, EMF, climate action and circular economy

- Electromagnetic compatibility, resistibility and lightning protection
- Soft error caused by particle radiations
- Human exposure to electromagnetic fields (EMF)
- Circular economy and e-waste management
- ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions

Overview of ITU-T standards on e-waste and circular economy



Digital Product Passport

- *ITU definition*

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

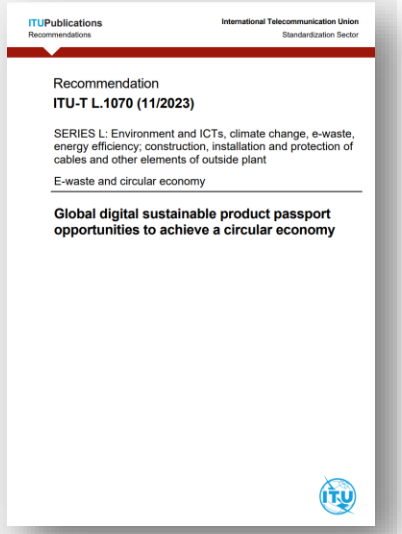
ETSI TS 103 881 V1.1.1 (2024-01)

TECHNICAL SPECIFICATION

Environmental Engineering (EE);
Global digital sustainable product passport opportunities to achieve a circular economy

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)

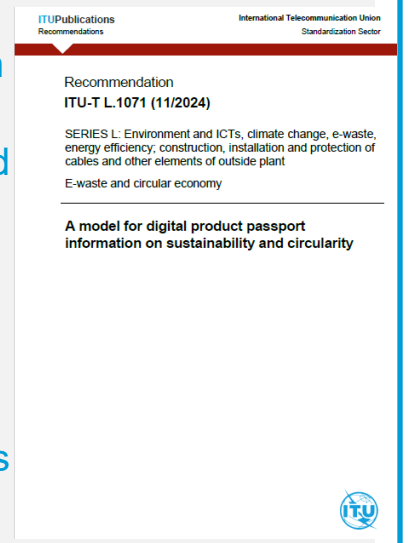
SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

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.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E-waste and circular economy

A model for digital product passport information on sustainability and circularity

ETSI ES 204 082 V1.1.1 (2025-01)

ETSI STANDARD

Environmental Engineering (EE);
An information model for digital product information on sustainability and circularity

Jointly developed with ETSI

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.

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
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- 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

Example

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 ongoing work on DPP system architecture – ITU-T SG20

- **Draft Recommendation ITU-T Y.DPP-ICT "Requirements and System Architecture of Digital Product Passport for ICT Goods"**

  Identifies requirements and defines a system architecture for Digital Product Passports in the ICT sector that links ICT goods to their digital passports across their lifecycle, from manufacturing and distribution to use, repair, reuse, and end-of-life

- **Technical Report ITU-T YSTR.OS-DPP-ICT "A case study of an open-source Digital Product Passport system for ICT goods use case**

A **Framework** for Digital Product Information Systems

1 Phase 2024

a) Data Assessment & Technical overview

- Value proposition
- Identified potential data categories and framework outline

b) Consultations:

- Over 40 countries and over 200 organizations
- Global South engagement
- New partners

2 Phase 2025

c) Pilot testing

- High-impact sectors: ICT and textiles.

d) Draft Framework

- Moving from technical to political conversation to get buy in.

3 Phase 2026 and onwards

e) Launch and promote adoption/use on a voluntary basis by Member States and stakeholders

- High level political forums: UNEA, HLPF, UNGA, etc.

Standard under development

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

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.

Upcoming meeting & events

- **MOOC Webinar: Reducing E-waste by design, the role of International Standards for E-waste Management**
  - Thursday, 23 October 2025; 15:00 to 16:00 CEST(session in Spanish)
- **ITU-T Study Group 5**, Geneva, 29 October – 6 November 2025

Thank you

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