



# ITU standards driving Sustainable Digital Transformation

Presented by: Dominique Würges



27/04/2023



# Main topics



**Electromagnetic compatibility, resistibility and lightning protection**



**Human exposure to electromagnetic fields**



**Soft error caused by particle radiations**



**Circular economy and e-waste management**



**ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions**



**COP Biodiversity**



# Sustainable Digital Transformation and Standards



International standards represent the amalgamation of knowledge contributed by experts from around the world!



## For cities and governments

- Reduce carbon emissions
- Achieve a sustainable digital Transformation
- Improve uptake of green energy
- Achieve targets set in the Paris Agreement and SDGs



## For ICT Sector

- Technical guidance to implement green energy solutions
- Provide measurement tools to evaluate progress
- Bring low-cost connectivity to rural areas
- Reach net-zero



# International Standards on Sustainable Digital Transformation

Sustainable Digital Transformation



**E-waste Management**

- Standards to help **sustainable e-waste management systems, recycling procedures** and move us towards a circular economy.



**Circular Economy**

- **Designing with circularity and sustainability in mind** avoiding waste and facilitating their recovery and re-use during their end-of-life phase.



**Energy Efficiency, Green Network and Data Centres**

- Identifying the **environmental and energy efficiency requirements for ICTs** .
- Providing solutions for assessing **environmental performance of green networks and data centres**.



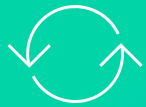
**GHG Emissions and ICT Sector**

- Providing **trajectories, best practices, and targets** to help the ICT sector move towards **decarbonization and Net Zero emissions**.

*To support and provide guidance to government, industry, and academia*



# ITU-T Standards Driving Sustainable Networks



## Circular Design Criteria

Recommendation  
ITU-T L.1023



## Assessing ICTs GHG Emissions

Recommendation  
ITU-T L.1410



## Assessing Energy Efficiency of Networks

Recommendation  
ITU-T L.1331



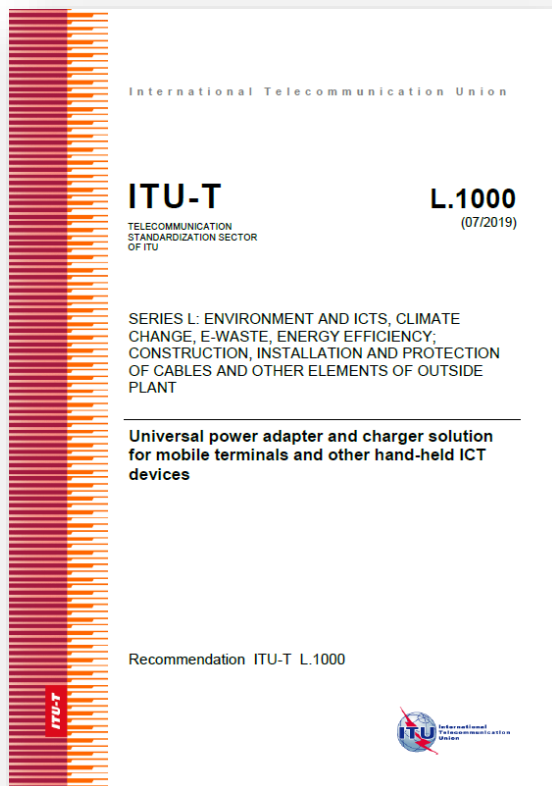
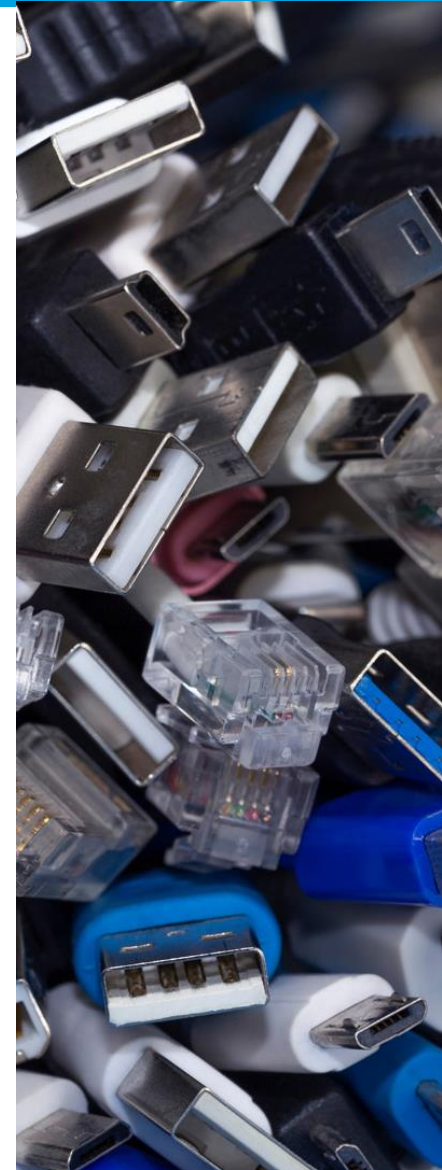
## Assessing GHG Emissions of Networks

Recommendation  
ITU-T L.1333

## TRANSITION TO NET ZERO

Sets the trajectories of GHG emissions for the global ICT sector and sub-sector  
Recommendation ITU-T L.1470

# Shifting the ICT Sector to a Circular Approach

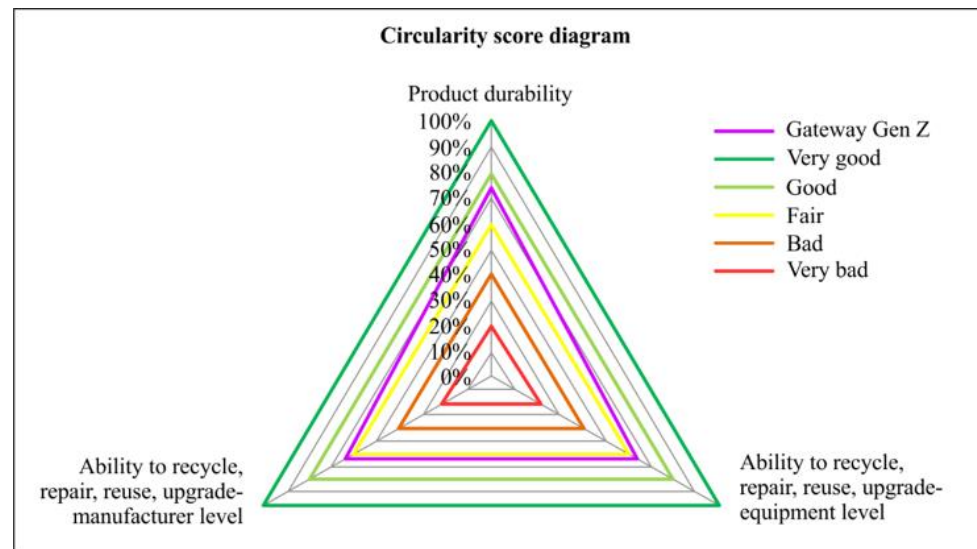
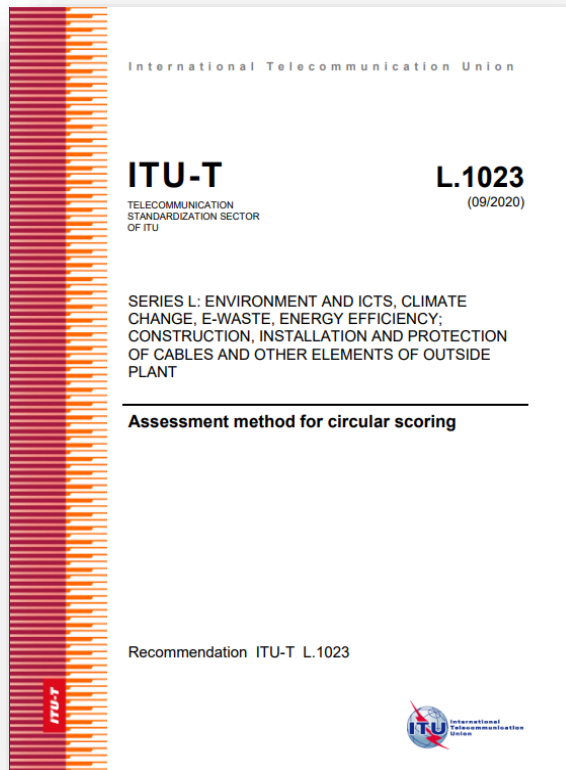


- Improper e-waste management can result in considerable environmental and health risks.
- International standards such as the requirements for a universal charger can mitigate 50 000 tonnes of e-waste. Has been adopted by the European Union.

# Circular Design principles

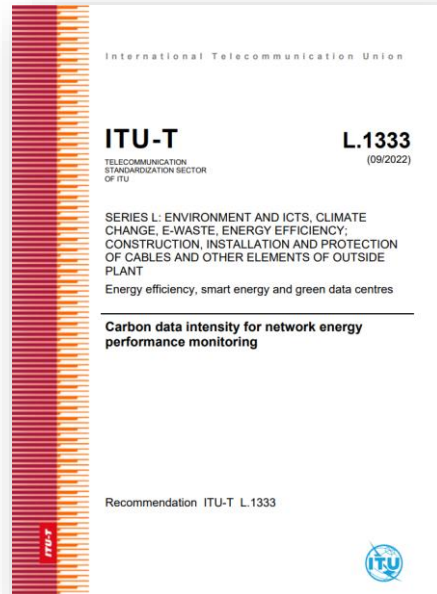


- Provides a method to assess the circularity of an ICT goods
- Implemented by several operators

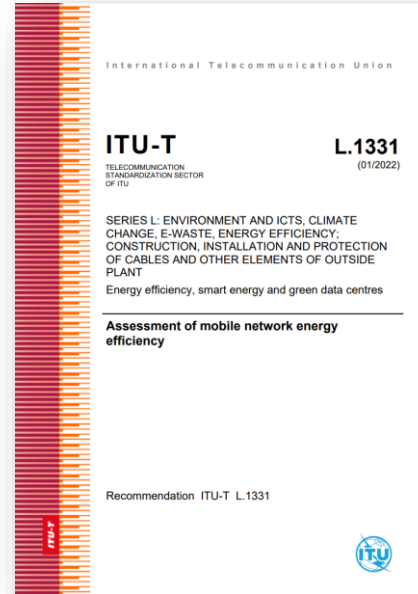


Planned to be accompanied with:  
Circular scoring tool

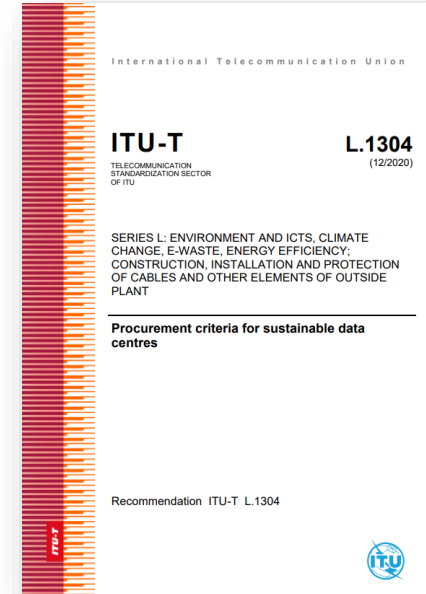
# Energy Efficiency, Green Network and Data Centers



Defines a **KPI useful to evaluate network emission** and give an indication on how a network can reduce its emission due to energy usage



Provides **metrics and methods of assessing energy efficiency** in operational networks

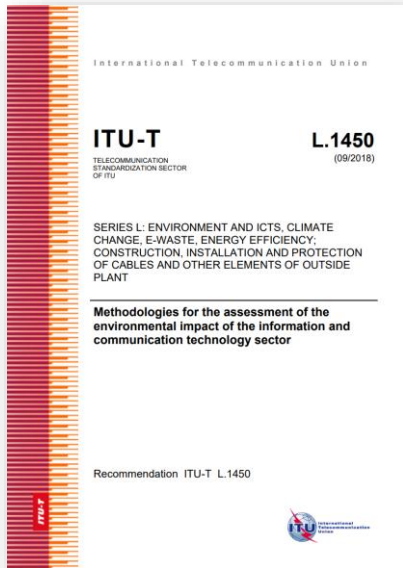


**Support public authorities in purchasing data centres related products, services and items** with reduced environmental impacts through establishing a set of procurement criteria

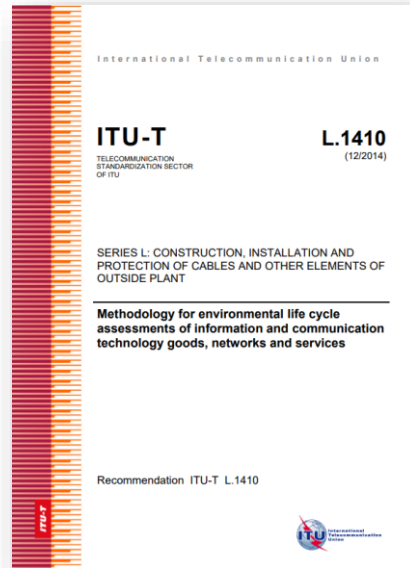




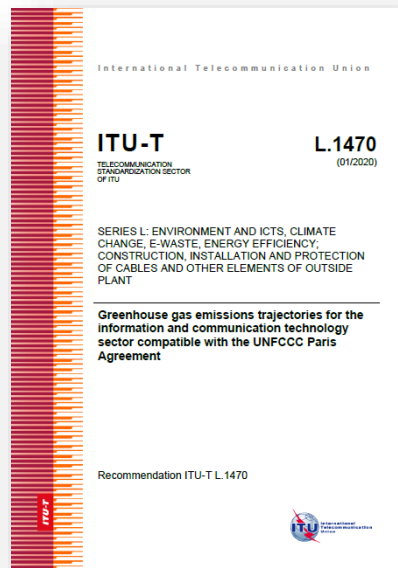
# Leveraging Digital Technology for GHG Reduction



Provides a methodology for calculating the **ICT sector footprint with respect to life cycle GHG emissions**



As of today, it is the **only international standard that deals with the life cycle assessment of ICT goods and services**

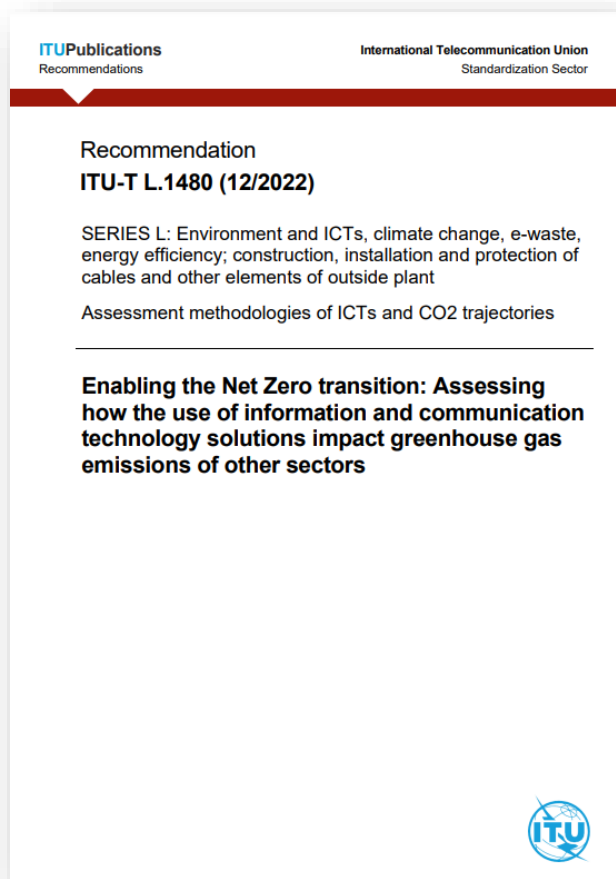


Standards provide **detailed trajectories on how to reduce the ICT Sector's GHG emissions by 45% by 2030.**



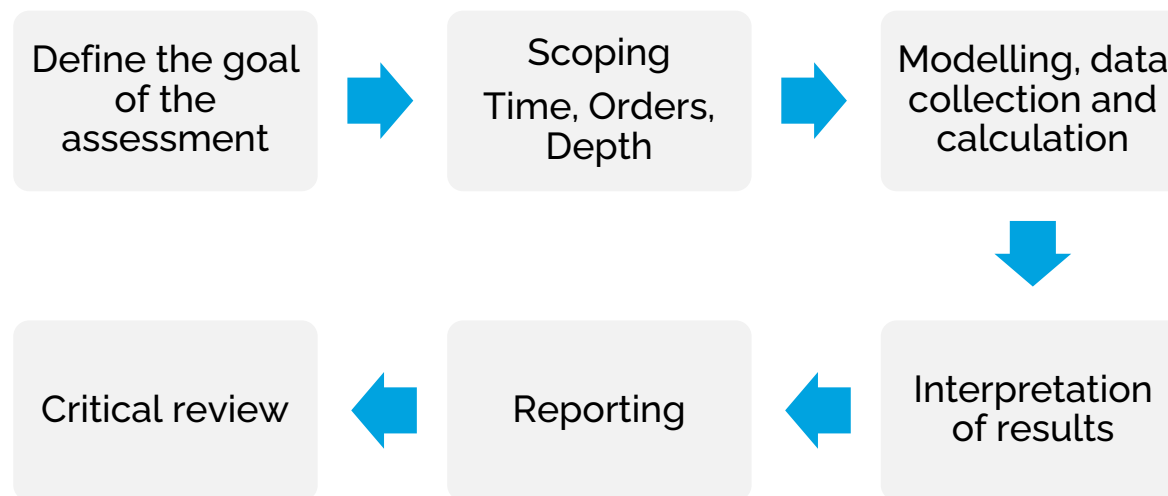


# Enabling the Net Zero transition



- Provides a methodology on **how to assess ICT and digital technologies solutions impact GHG emissions**
- Being used by the **European Green Digital Coalition**

## Six steps to assess an ICT solution

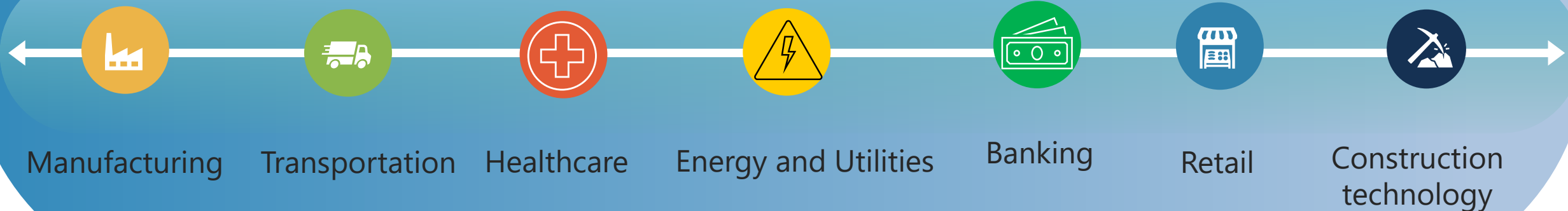


**Example: Assessing the impact of a virtual event**



# Digital solutions Enabling the Net Zero transition in the vertical industry

## ICTs and Digital Technologies solutions





**Coming soon:**

## Scope 3 – Guidance for ICT Telecommunication Operators

ICT companies are committing to reduce not only their own GHGs, but also the emissions resulting from their value chain, including their supply chain and customers.

**How to measure the inventory of value chain emissions (scope 3)?**

This Guidance harmonizes methods for telecommunication operators to assess and report their scope 3 GHG emissions, and to increase its coverage, and transparency.

Category 1:  
Purchased  
goods and  
services

Category 2:  
Capital Goods

Category 3:  
Fuel and  
energy-related  
activities

Category 8:  
Upstream  
leased assets

Category 11:  
Use of sold  
products

# Creating Global Partnerships and collaboration with SDOs



# Working together to **reduce environmental impact** and **achieve a sustainable digital transformation**



## Development of technically aligned standards on

By fostering collaboration between industry leaders, we can **streamline efforts, eliminate duplication and support the ICT sector** through the development of relevant standards.



Data Centres,  
Energy storage and  
Energy efficiency



Circular Economy

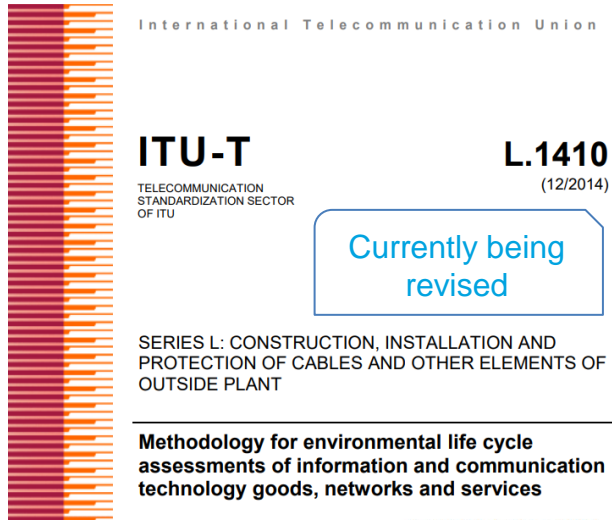


Assessment  
methodologies and  
enablement effect of ICT  
and digital technologies

- Q6/5 “Environmental efficiency of digital technologies”
- Q11/5 “Climate change mitigation and smart energy solutions”
  
- Q7/5 “E-waste, circular economy, and sustainable supply chain management”
  
- Q9/5 “Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement”



# Examples of technically aligned standards



International Telecommunication Union


**ITU-T** **L.1410**  
TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU (12/2014)

Currently being revised

SERIES L: CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

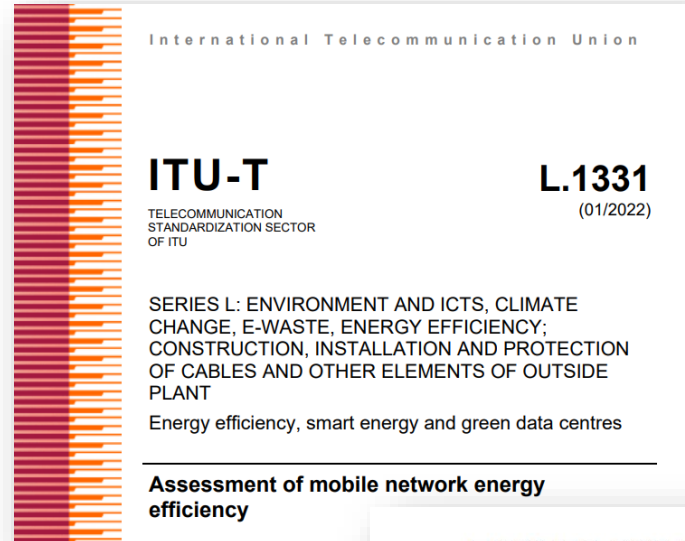
**Methodology for environmental life cycle assessments of information and communication technology goods, networks and services**

ETSI ES 203 199 V1.3.1 (2015-02)



ETSI STANDARD

Environmental Engineering (EE);  
Methodology for environmental Life Cycle Assessment (LCA)  
of Information and Communication Technology (ICT)  
goods, networks and services



International Telecommunication Union


**ITU-T** **L.1331**  
TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU (01/2022)

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

Energy efficiency, smart energy and green data centres

**Assessment of mobile network energy efficiency**

ETSI ES 203 228 V1.3.1 (2020-10)



ETSI STANDARD

Environmental Engineering (EE);  
Assessment of mobile network energy efficiency



# Collaboration with other SDOs – How to strengthen?



**World Standards  
Cooperation**



**Information sharing**

- Liaison officer representatives
- Liaison statements

**Maybe, more can be done?**





## Collaboration with other SDOs – Proposed way forward



Information sharing?



- Leveraging on ITU-T A.5 Recommendation: **Generic procedures for including references to documents of other organizations in ITU-T Recommendations**



- Joint collaboration? – Letter of interest



- Ultimate possible goal: Developing jointly **technically aligned deliverables** on topics of mutual interest



# Some areas of ongoing Work in ITU-T SG5

**Digital product passport**

**Collection, pre-treatment, dismantling, valorization and final disposal of WEEE**

**Assessment of material efficiency of ICT network goods**

**Energy efficiency metrics, KPIs and measurement methods**

**Definition of Sustainable Digital Transformation**

**Monitoring efficiency of networks**

**Guidance on simplified life cycle assessments of ICT**

**Supply chain management**

**Guidance for the creation of an ITU database on GHG emissions of the global ICT sector**

**Assessment of the carbon footprint of ICT goods**

**ICT and Biodiversity**

**Liquid cooling for data centres**

**Upcoming meeting**

**ITU-T SG5 meeting  
jointly with ETSI TC EE  
13-23 June 2023  
Sophia Antipolis, France**





# Thank you!

**Contact:**

Dominique Würges  
ITU-T SG5 Chairman

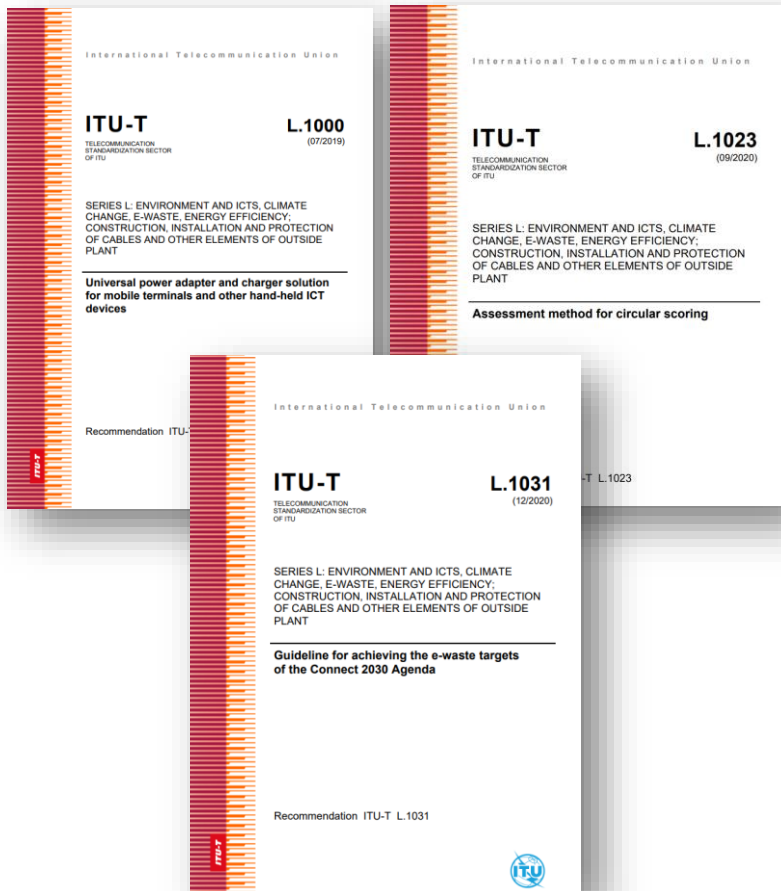
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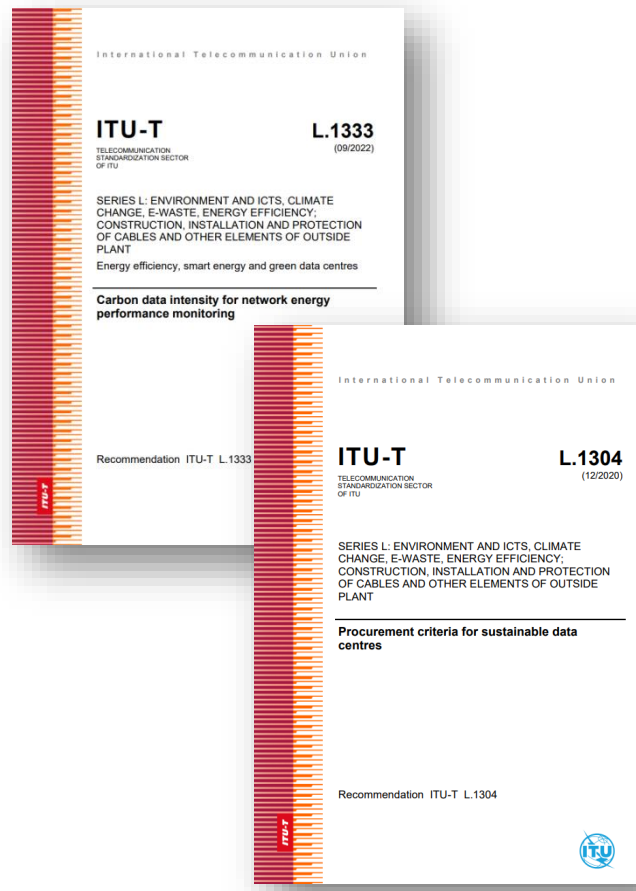
# Additional slides

# Examples of ITU International Standards

## E-waste and Circular Economy



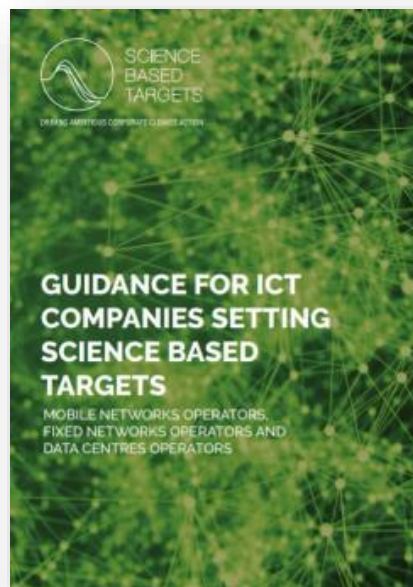
## Energy Efficiency, Green Network and Data Centres



## ICT sector GHG emissions and Enablement effect of ICT



# Publishing Research



*Science-based publications, toolkits, case studies and thought leadership*

# Driving Sustainability Through Events and Webinars

**ITUWebinars**

## 10th Green Standards Week

*Driving Sustainable Digital Transformation through sustainable e-waste management and circular economy*

14-16 December 2021  
16:00-19:00 CET

<https://itu.int/go/GSW2021>



**ITUWebinars**

## Sustainable digital transformation dialogues

28-30 September 2021



**ITUEvents**

14th symposium on ICT, environment, climate change and circular economy

## Sustainable digital transformation: the role of ICTs and digital technologies in achieving net zero carbon

Rome, Italy  
25 October 2022

<http://itu.int/go/14Symposium>

Hosted by:  TOR VERGATA  
Organized by:  *Ministero delle Politiche Economiche*



*Bringing together key industry, academia and ICT experts*

New events and webinars  
scheduled for 2023!

# Development of technically aligned deliverables (1)



## Energy Efficiency

- **L.BBU:** Requirements and use cases of liquid cooling solutions and high energy efficiency solutions for 5G BBU in C-RAN mode
- **L.EE\_serv:** Energy Efficiency measurement methodology and metrics for servers.
- **L.EE\_sgpu:** Energy Efficiency measurement methodology and metrics for servers: Graphical Processor Unit (GPU) solution based
- **L.MCI\_MIM and L.MCI\_Gen:** Monitoring and Control Interface for Infrastructure Equipment

Q6/5 “Environmental efficiency of digital technologies” and Q11/5 “Climate change mitigation and smart energy solutions”

ETSI TC “Environmental Engineering”





# Development of technically aligned deliverables (2)



## Circular Economy

### “Assessment of material efficiency of ICT network goods Circular economy”

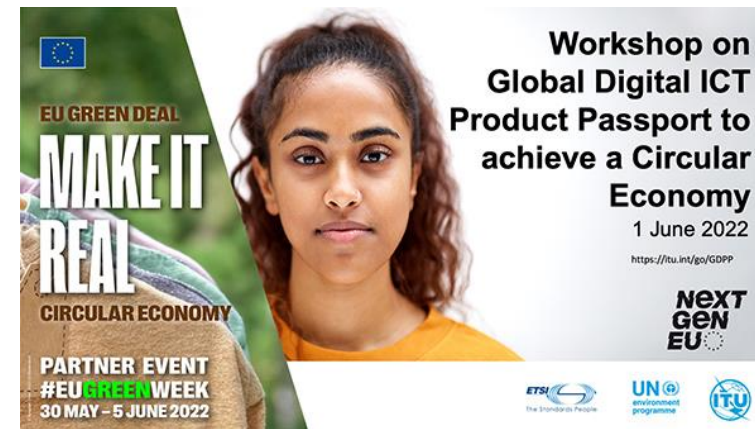
- ETSI EN 303 800-1/ ITU-T L.Mat\_frame  
Part 1: General for server and data storage equipment.
- ETSI EN 303 800-2/ ITU-T L.ME\_DD  
Part 2: Server and data storage product secure data deletion functionality.
- ETSI EN 303 800-3/ ITU-T L.ME\_AF  
Part 3: Server and data storage product availability of firmware and of security updates to firmware.
- ETSI EN 303 800-4/ ITU-T L.ME\_RM  
Part 4: Server and data storage product critical raw materials.
- ETSI EN 303 800-5/ ITU-T L.ME\_DIS  
Part 5: Server and data storage product disassembly and disassembly instruction

### Digital Product Passport for ICT

- ITU-T L.GDSPP: Requirements for a global digital sustainable product passport to achieve a circular economy
- ITU-T L.D4PI: An information model for digital product information on sustainability and circularity

Q7/5 “E-waste, circular economy, and sustainable supply chain management”

ETSI TC “Environmental Engineering”



The poster features a woman's face in the center. On the left, it says 'EU GREEN DEAL MAKE IT REAL CIRCULAR ECONOMY'. On the right, it says 'Workshop on Global Digital ICT Product Passport to achieve a Circular Economy 1 June 2022 https://itu.int/go/GDPP'. At the bottom, it says 'PARTNER EVENT #EUGREENWEEK 30 MAY - 5 JUNE 2022' and includes logos for ETSI, UN Environment Programme, and ITU.



## Development of technically aligned deliverables (3)



### Assessment methodologies of ICT

- **L.1410rev:** Methodology for environmental life cycle assessments of information and communication technology goods, networks and services
- **L.SimplifiedLCA:** Guidance on simplified life cycle assessments of Information and Communication Technologies

Planned to be a technically aligned deliverable:

- **L.1480:** Enabling the Net Zero transition: Assessing how the use of information and communication technology solutions impact greenhouse gas emissions of other sectors

Q9/5 “Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement”

ETSI TC “Environmental Engineering”

