

The role of standards for a Green & Resilient Digital Infrastructure

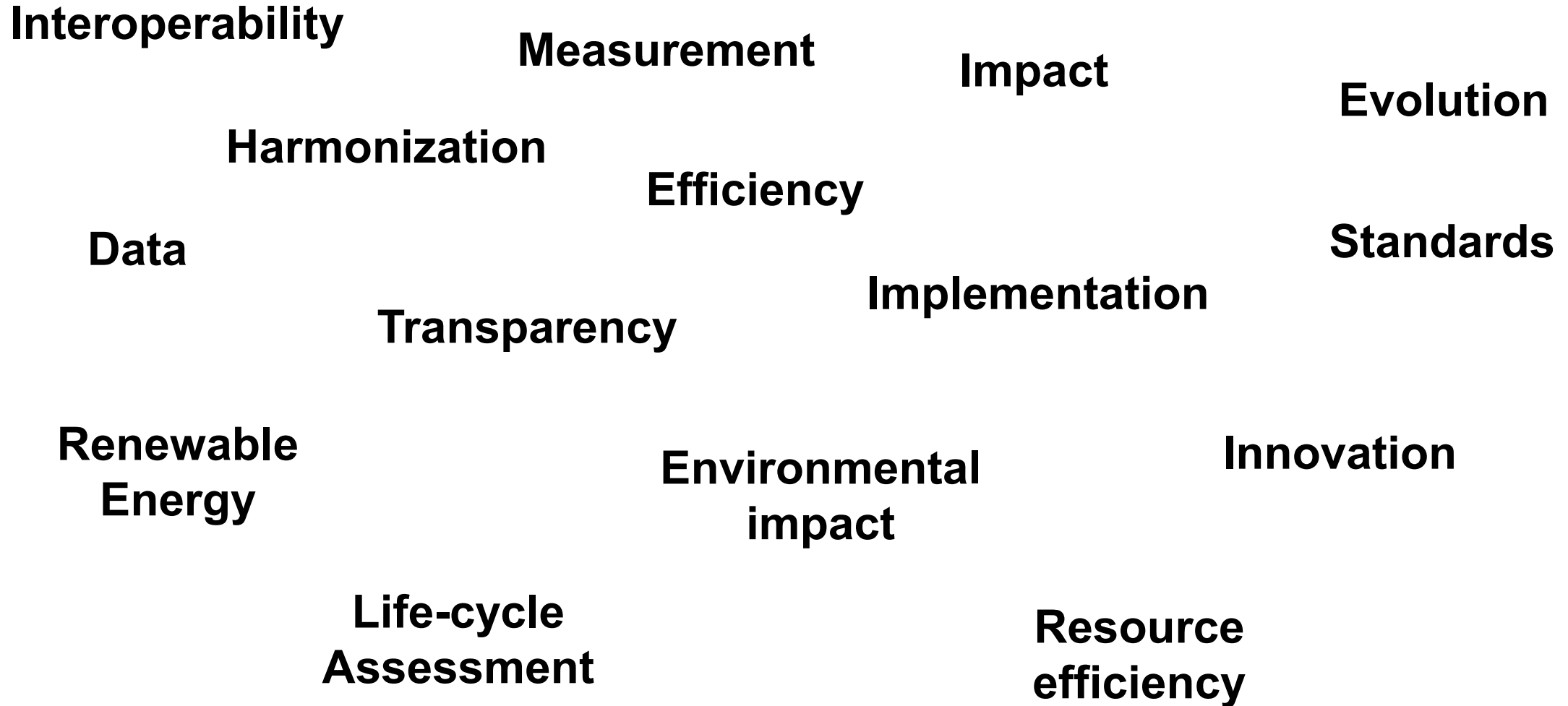
Dominique Würges

Chair, ITU-T Study Group 5

Environment, EMF, Climate Action and Circular Economy



What comes to mind when you hear “Sustainable ICT and Climate Action”?



Building a Green Telecom Network



The entire ICT industry uses approximately 4% of the world's electricity for its operation and represents 1,4% of the global greenhouse gas emissions from a life cycle perspective

More than 90 percent of network cost spent on energy, consisting mostly of fuel and electricity, the demand for energy-saving measures from telecom operators is growing



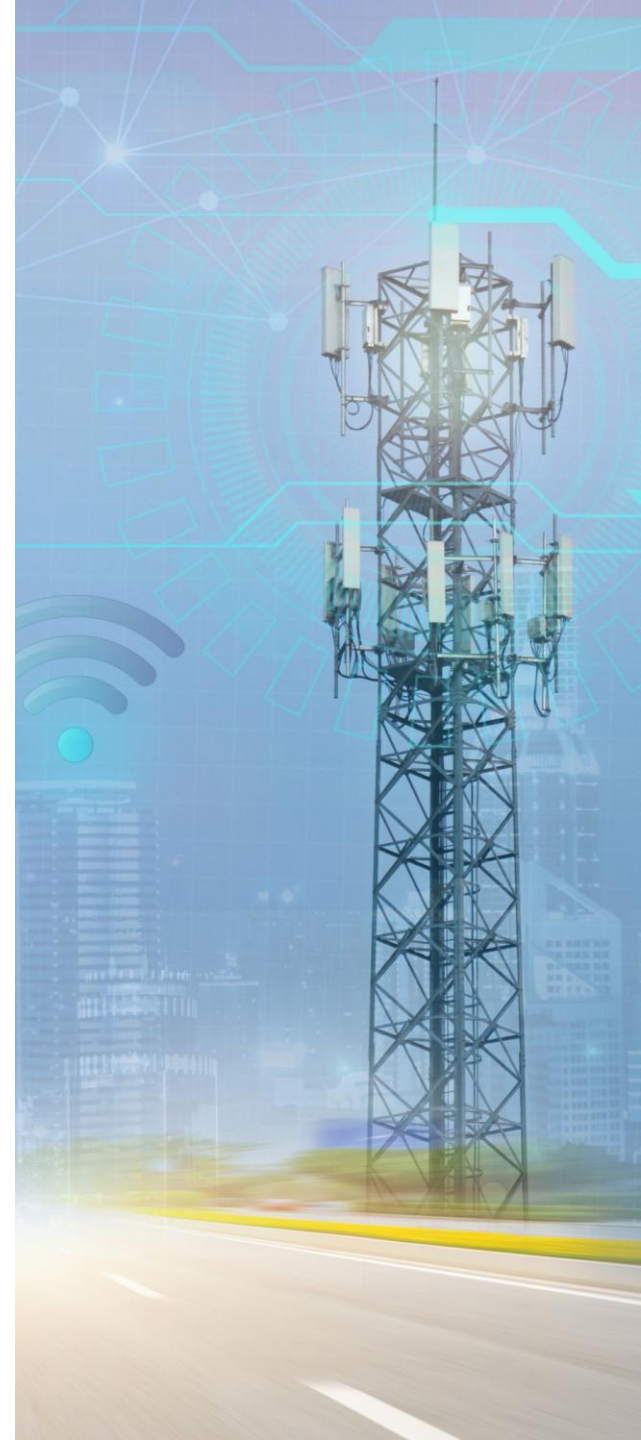
How ITU is supporting green networks



ITU-T Study Group 5

EMF, environment, climate action, sustainable digitalization, and circular economy

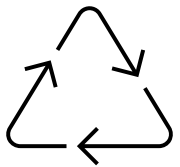
- Electromagnetic compatibility, resistibility and lightning protection
- Soft error caused by particle radiations
- Human exposure to electromagnetic fields (EMF)
- Circular economy and e-waste management
- ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization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



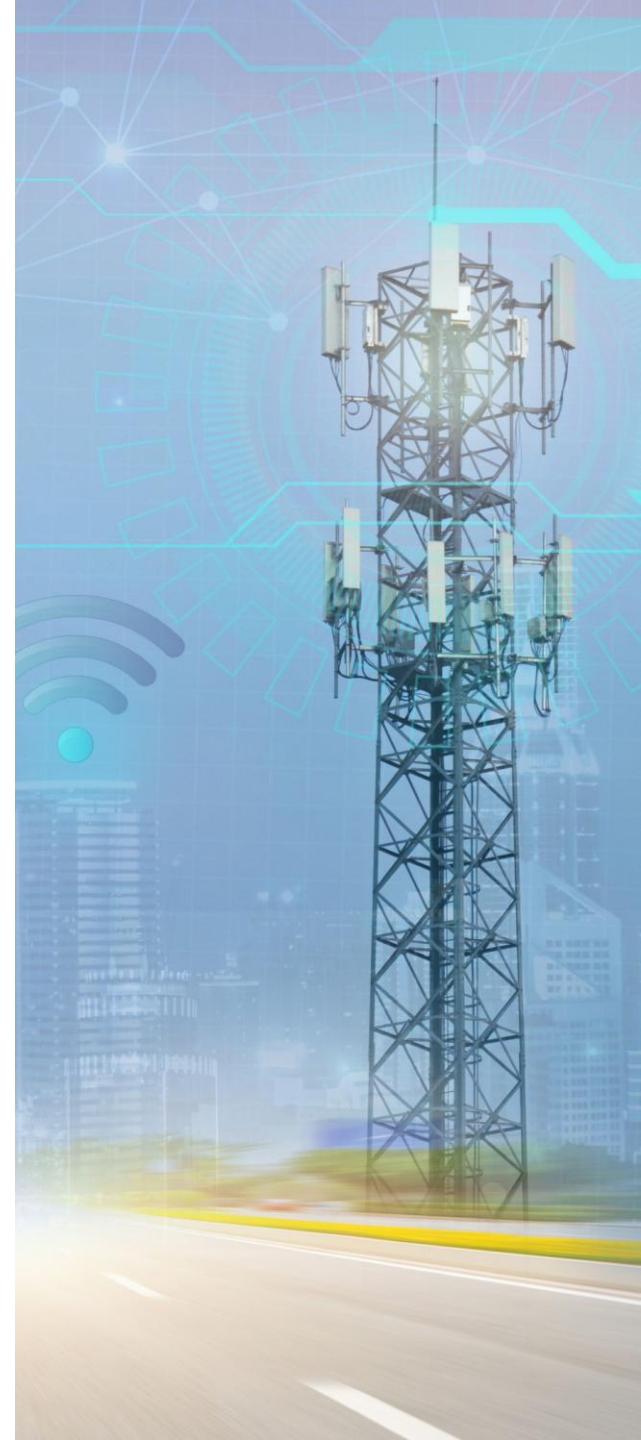
Global picture



- **At the global level**, ITU-T SG5 has adopted international standards that provide detailed trajectories on **how to reduce the ICT Sector's GHG emissions by 45% by 2030 (ITU-T L.1470)**.
- Additionally, ITU-T L. 1450 provides a methodology for calculating the ICT sector footprint with respect to life cycle GHG emissions. This helps enabling the Net Zero transition.

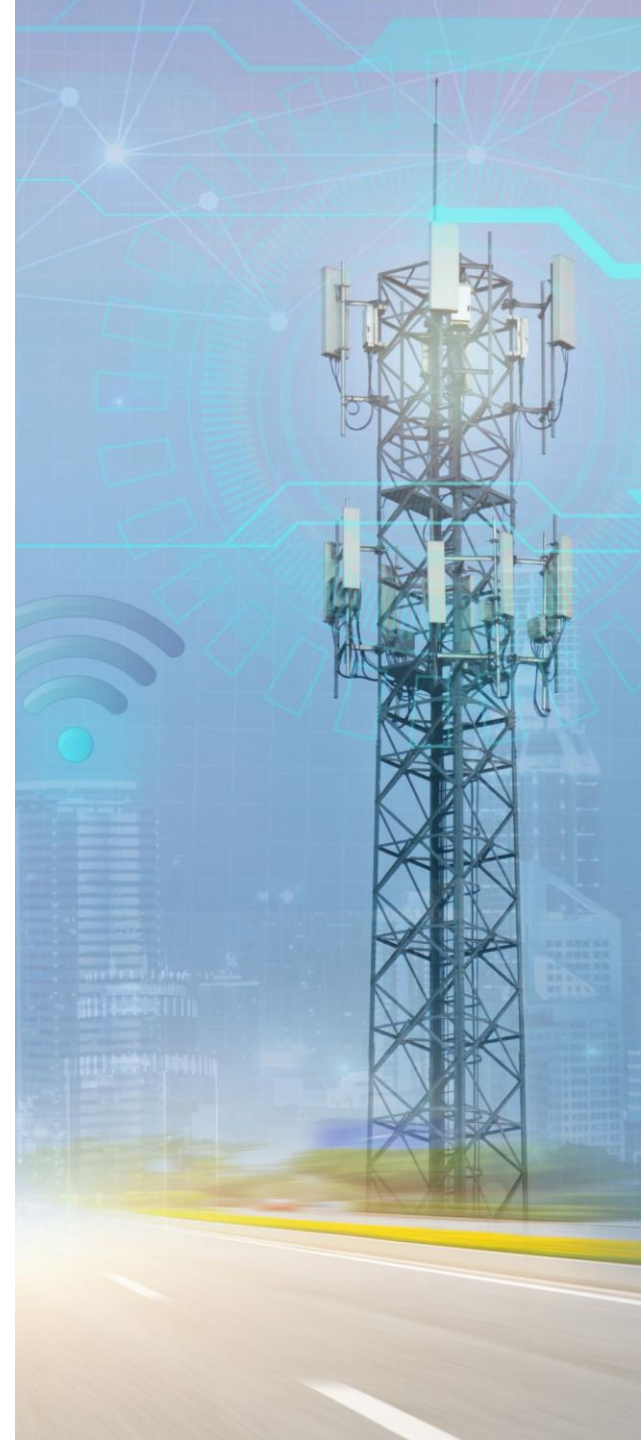


- **A circular and sustainable approach for products**: ITU-T L.1023 provides a method to assess the circularity of ICT goods, describing the use of Circular Design principles for the development of ICT goods.

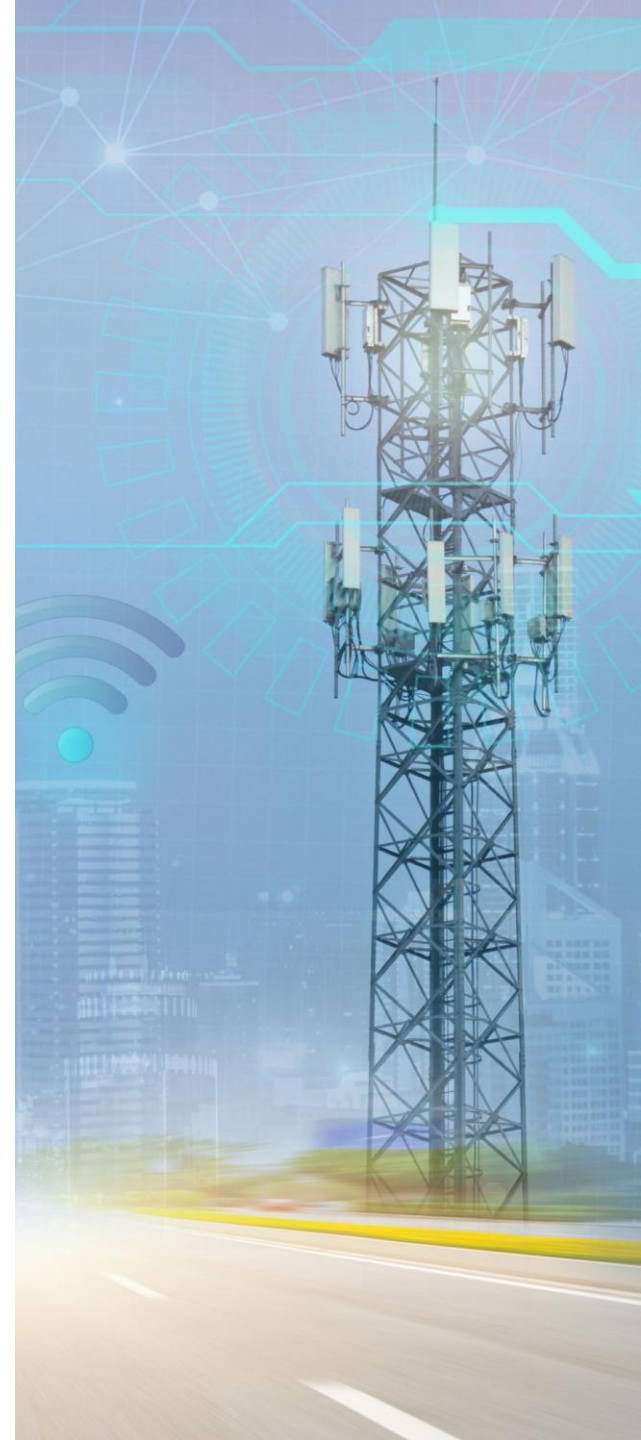
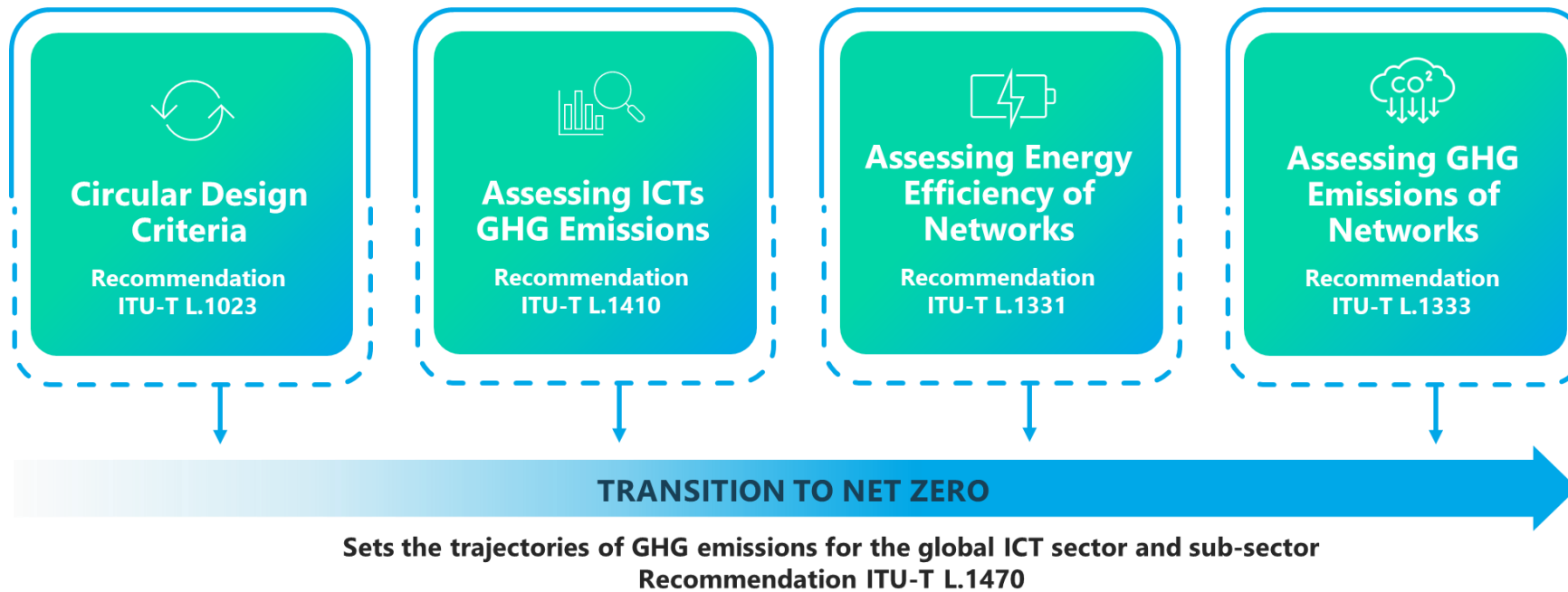


Global picture (2)

- **Activities on Energy Efficiency, Green Network and Data Centers:**
 - ITU-T L.1333 defines a **KPI useful to** evaluate network emission and give an indication on how a network can reduce its emission due to energy usage,
 - ITU-T L.1331 **provides metrics and methods of assessing energy** efficiency in operational networks
 - ITU-T L.1304 supports public authorities in purchasing **data centres related products**, services and items with reduced environmental impacts through establishing a set of procurement criteria.



ITU-T Standards Driving Sustainable Networks



Sustainable and efficient solutions for the power requirements of 5G networks

defines:

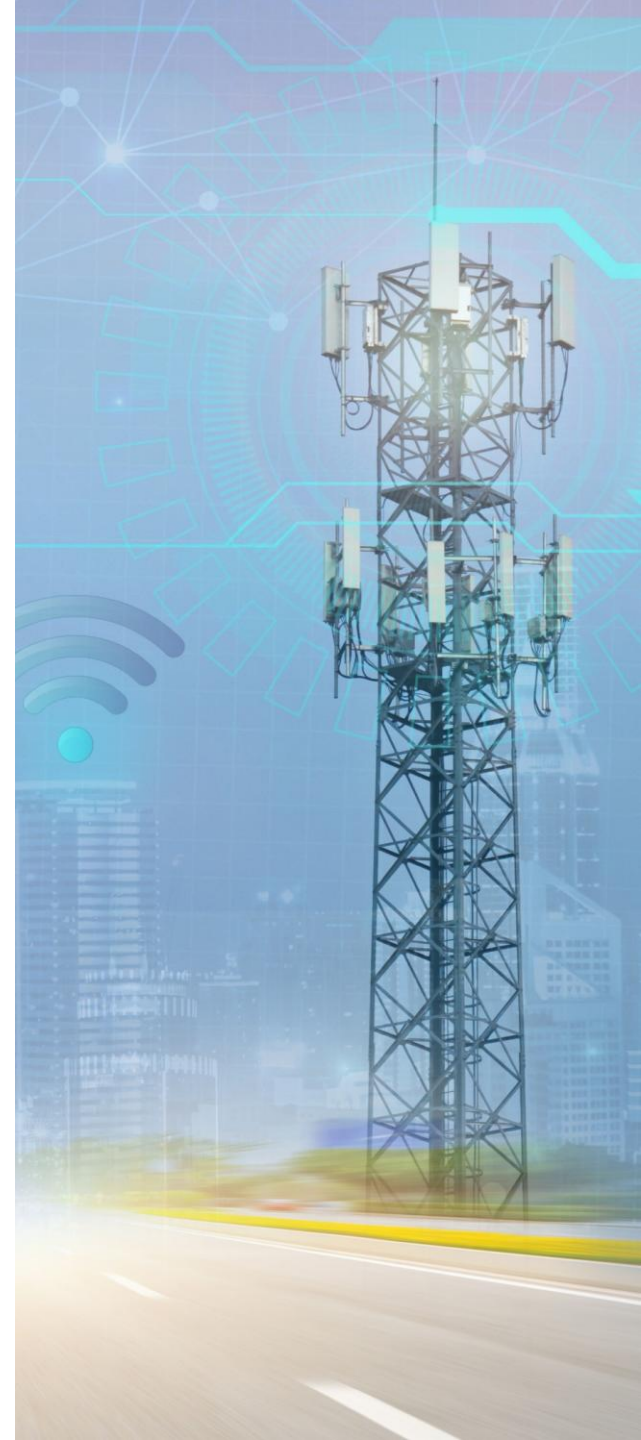
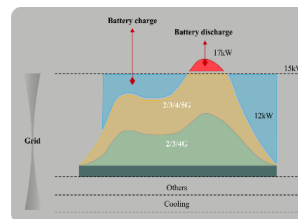
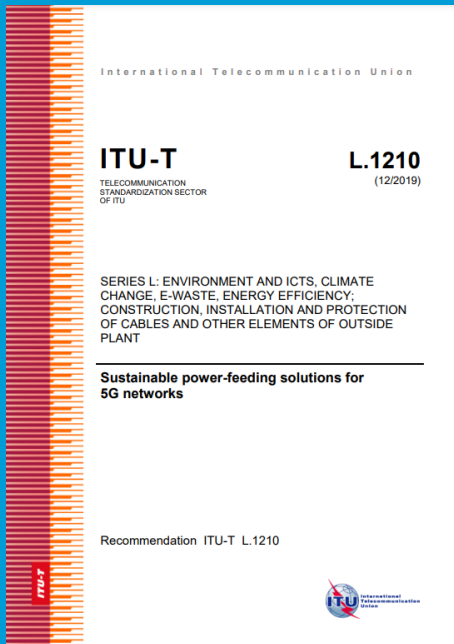
Smart
energy
solution

New power
feeding
solution

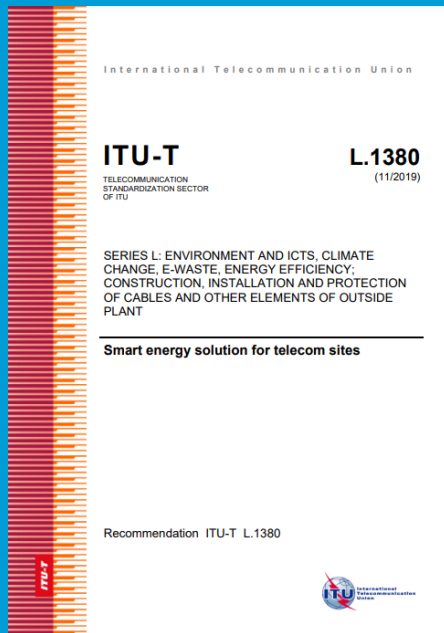
High density
solution

Intelligent
control

CO2
reduction
strategy



Smart energy solutions for telecom sites

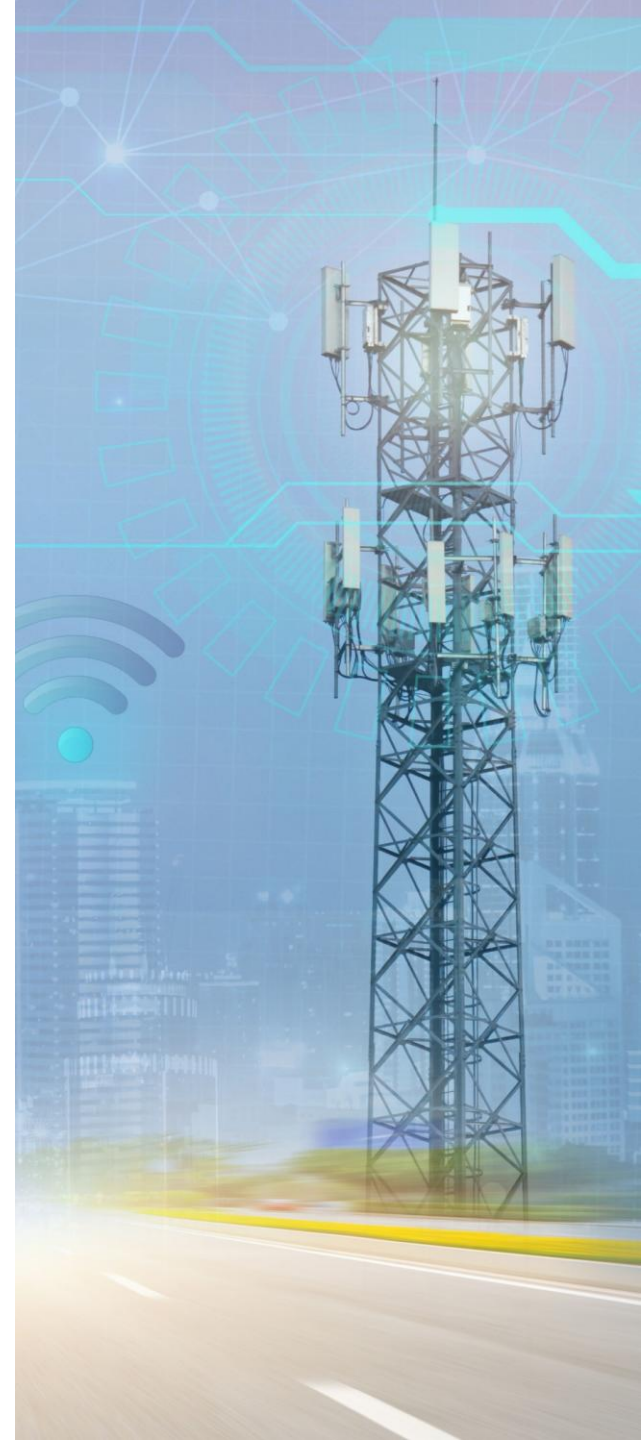


Renewable energies are used in priority

It can do the predictive diagnosis to ensure the safety of the power supply

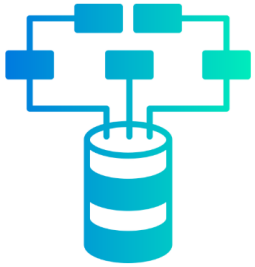
It improves energy efficiency

It minimizes operating costs



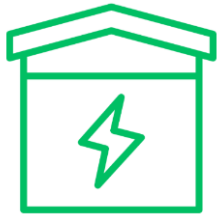
| New ongoing work dedicated to AI

Energy Efficiency & Data Centres



Optimization for multi-level thermal environment of Data Centre
(ITU-T L.optim_DC)

Power electronic transformers to reduce energy use and emissions in data centres (ITU-T LSTR_PET_DC)



Energy supply system architecture for AI computing scenarios
(ITU-T L.Arch_AI energy)

Energy efficiency metrics and measurement methodology for AI large model (ITU-T L.MM_AI model)

Circular Economy



Guidelines for circular use of AI computing resources
(ITU-T L.CU_AI)

AI Environmental Impact Assessment



Scoring AI Systems
(ITU-T L.Score_AI)



Aggregated AI environmental impact at worldwide, country & city
(ITU-T L.AggregatedAI)



Examples of Assessments of AI Systems
(ITU-T L.Suppl.ExamplesAI)

NEW

Standardization scope of ITU-T L.1801

Guidelines for Assessing the Environmental Impact of AI systems

Holistic framework for evaluating the environmental impact of AI, covering **direct and indirect impacts**, **assessment** and **mitigation** strategies

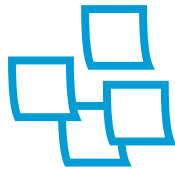


Based on:

- ITU-T L.1410: Methodology for environmental LCA of ICT goods, networks and services
- ITU-T L.1480: Enabling the Net Zero transition – Assessing how the use of ICT solutions impacts GHG emissions of other sectors



Full life cycle of AI systems



Comparative assessment

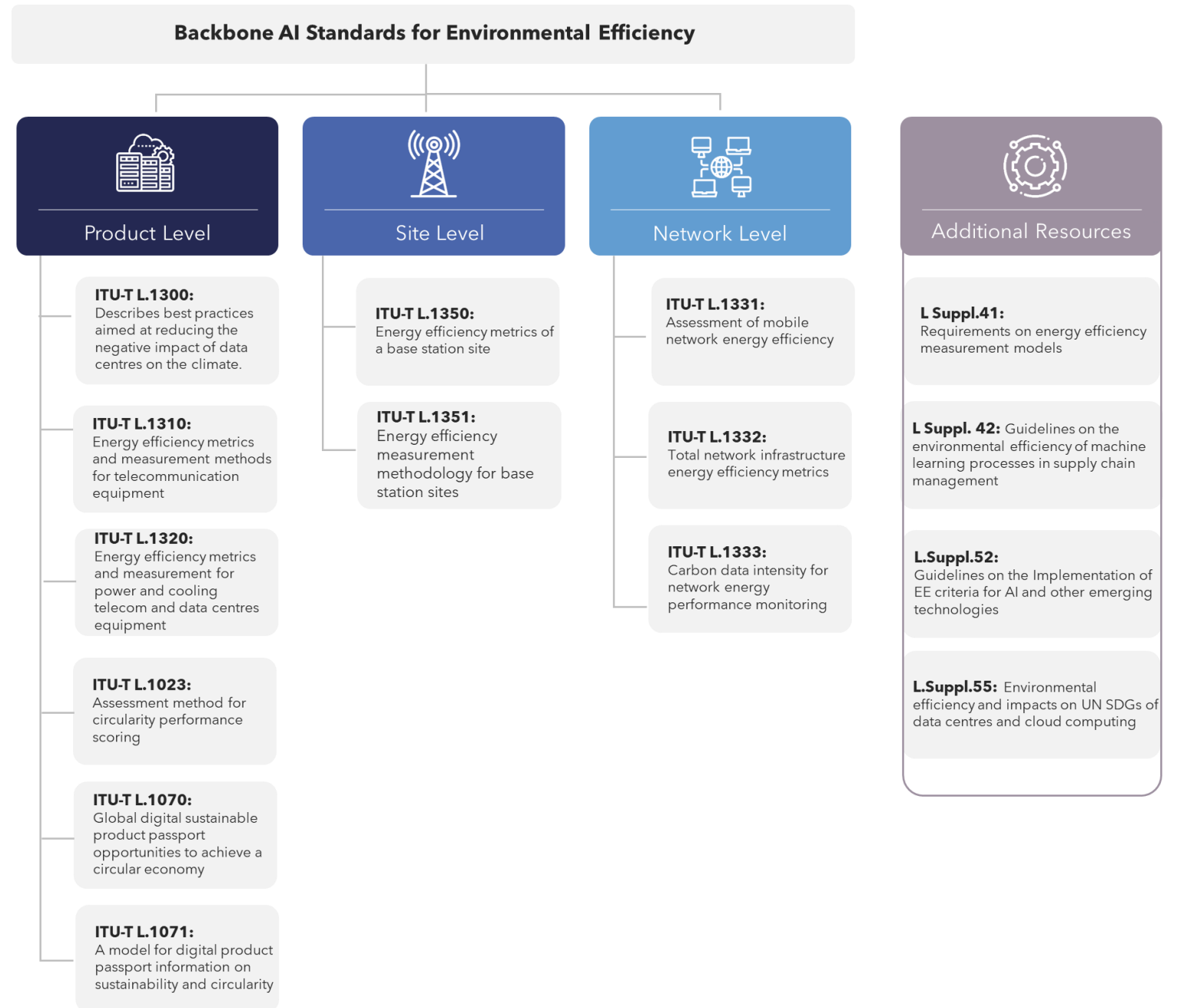
- AI technology compared to not using AI
- Impact comparison of two AI systems

Technically
aligned with:



| AI & Environment

- Provide **backbone standards** to measure and improve the **environmental performance of AI systems and infrastructure**.
- Enable **harmonized metrics** for energy efficiency, carbon intensity, and circularity across product, site, and network levels.
- Support **assessment and reduction of the environmental footprint of AI** and other emerging digital technologies.
- Contribute to **global efforts** aligning digital innovation with sustainability and climate objectives.



Dates of the next ITU-T SG5 meeting and upcoming events



[ITU-T SG5 Regional Group for Africa \(SG5RG-AFR\)](#)

Republic of Equatorial Guinea

19- 22 May 2026

[ITU-T SG5 meeting](#) -

France (Sophia Antipolis)

6 _19 June 2026



Thank you!

