How can we make cities sustainable?

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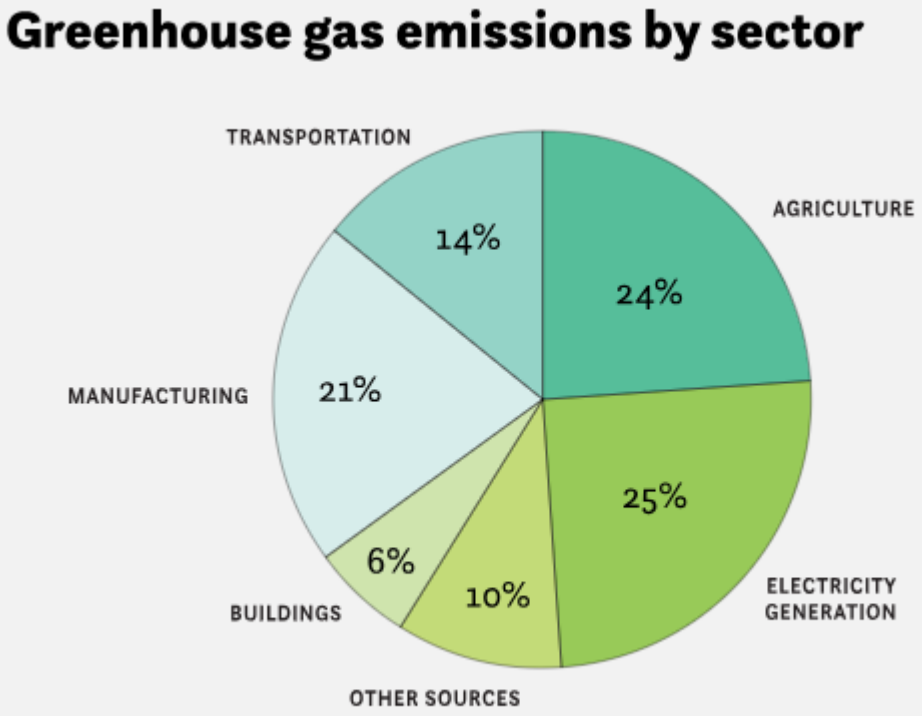
Project officer
ITU

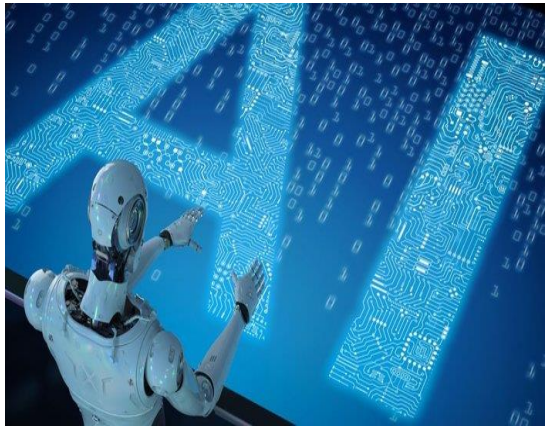
26 February 2019

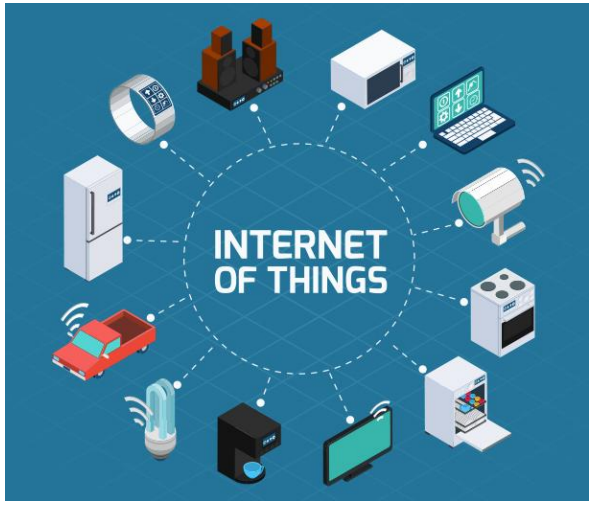

Cities have become awesome in size and also greenhouse gas emissions
Dirty air is cutting your life short by almost 2 years on average
Picture source: AOL

Where do the Greenhouse gas emissions come from ?



Source: IPCC (2014)





Potential to address

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

Lead Study Group for

EMC, lightning protection and electromagnetic effects

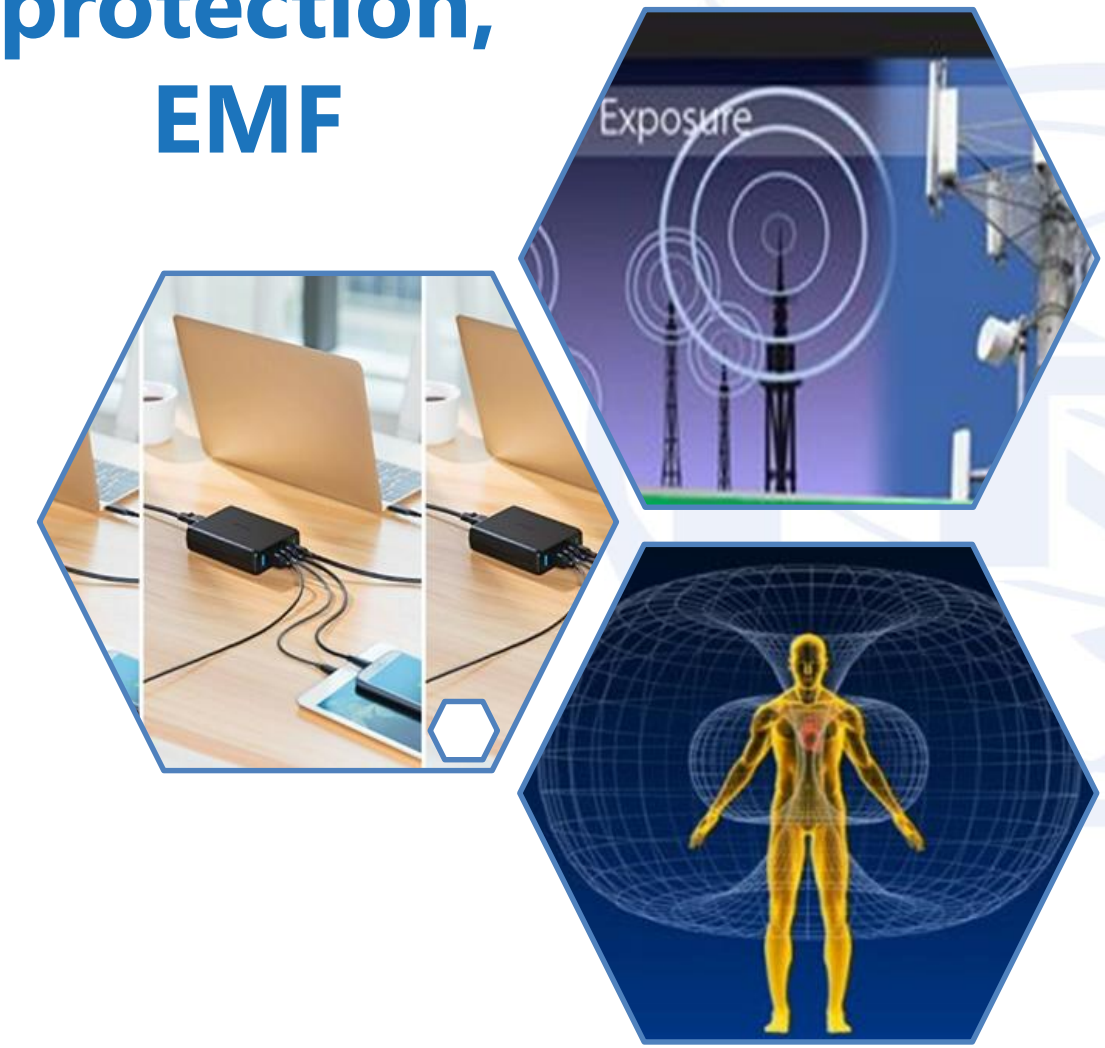
ICTs related to the environment, climate change, energy efficiency and clean energy

Circular economy, including e-waste

9 Questions

4 Regional Groups

EMC, lightning protection, EMF



Ongoing standardization work

- Ethernet port protection (wired internet access)
- Base station protection (wireless internet access)
- Multi-port surge protective devices
- EMC requirement for telecommunication equipment and cabling & in home
- Assessment and Monitoring of the Exposure to RF EMF

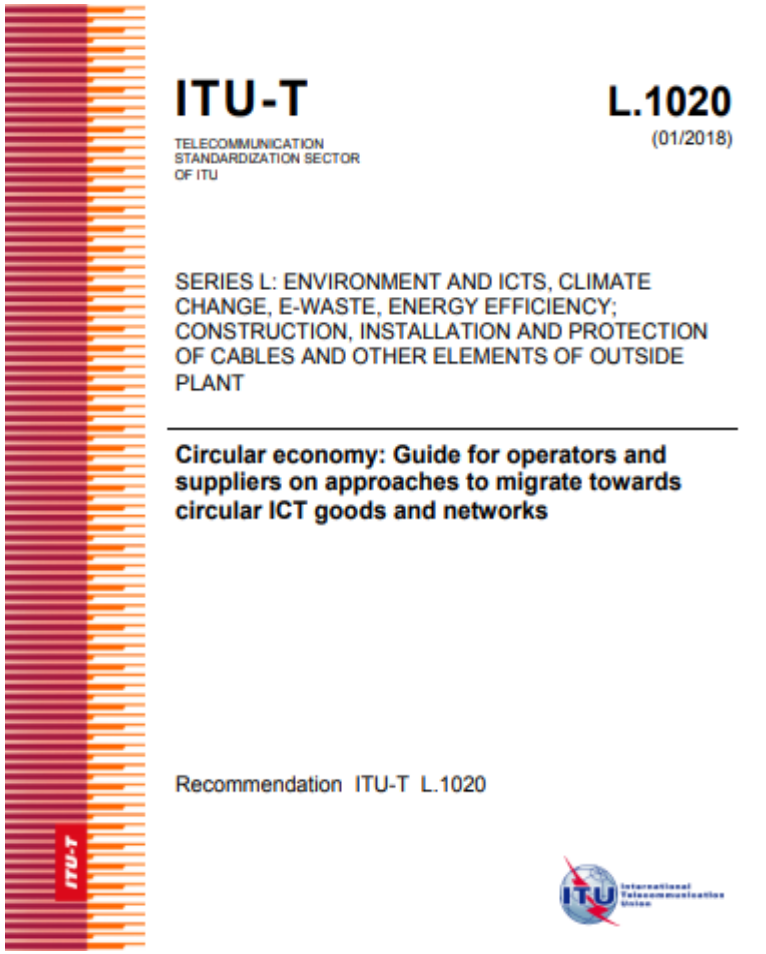
Environment, Energy Efficiency and the Circular Economy

Ongoing standardization work

- E-waste management and reduction
- Circular Economy
- Sustainability - Reducing GHG to Achieve SDGs
- Energy efficiency KPIs for ICT Goods, networks, services
- Efficiency of SC&C solutions
- Green Data Centers Solutions and KPI/metrics
- 5G/IMT2020 sustainable development: EE KPI/ Metrics, Power feeding solutions, environmental impact assessment

Examples of approved International Standards

ITU-T Recommendations



ITU-T

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

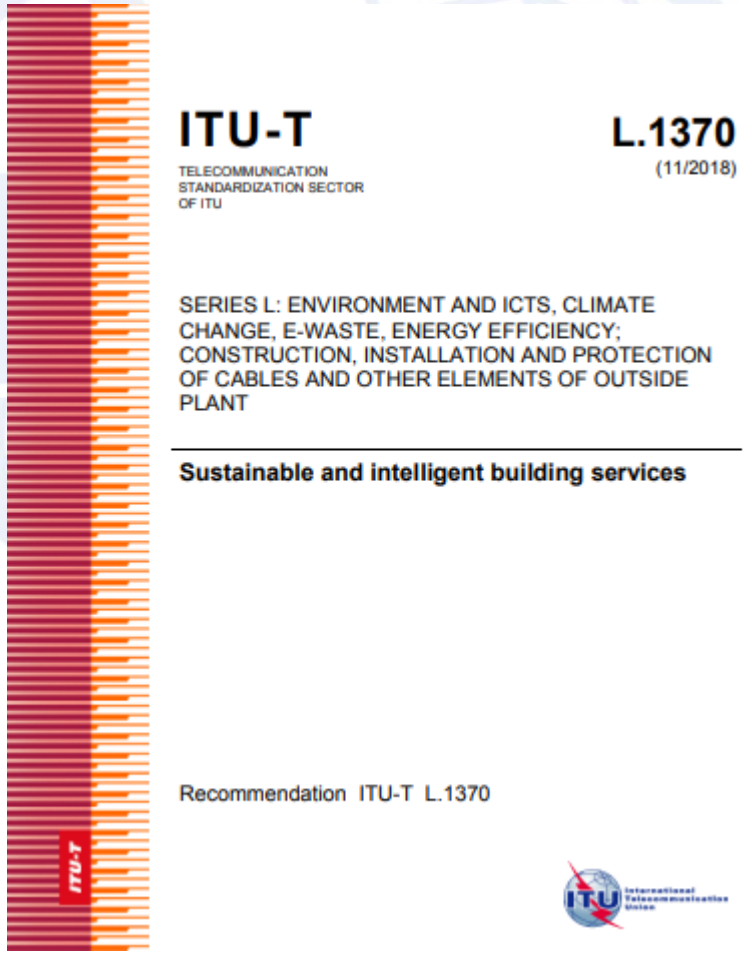
L.1020

(01/2018)

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

Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks

Recommendation ITU-T L.1020



ITU-T

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

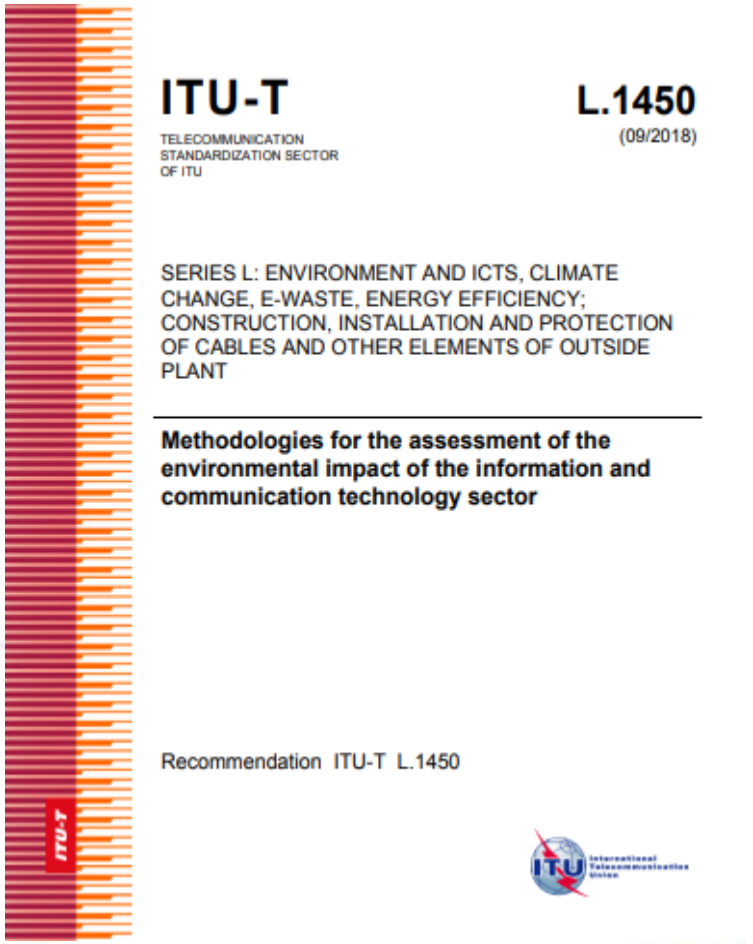
L.1370

(11/2018)

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

Sustainable and intelligent building services

Recommendation ITU-T L.1370



ITU-T

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

L.1450

(09/2018)

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

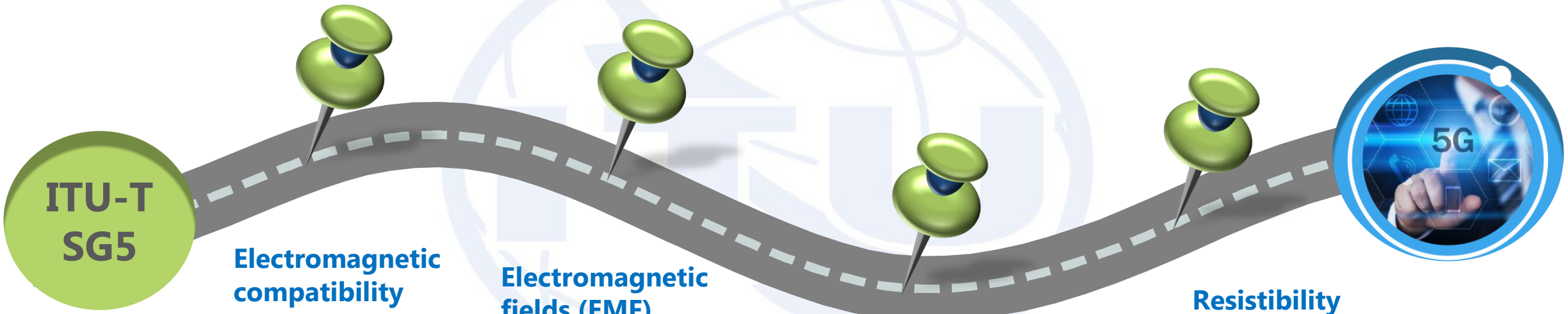
Methodologies for the assessment of the environmental impact of the information and communication technology sector

Recommendation ITU-T L.1450

***5G** will usher in a new era of driverless cars, smart buildings and much more. 5G cellular and wireless networks will be more densely connected. They will be catalyst for Internet of Things (IoT) innovation and technologies.*

Setting Environmental Requirements for 5G

International Standards | Supplements | Technical Reports



Electromagnetic compatibility (EMC)

ITU-T K.Suppl.10

Electromagnetic fields (EMF)

ITU-T K.Suppl.9
ITU-T K.Suppl.14
ITU-T K.Suppl.16

Energy feeding & efficiency

ITU-T L. 1220
ITU-T L.1221
ITU-T L.1222
ITU-T L. Suppl.36

Resistibility

ITU-T K.Suppl.8

Current work items on setting the environmental requirements for 5G

- Draft Recommendation ITU-T L.5G_powering on **“Sustainable power feeding solutions for 5G network”.**
- Draft Recommendation ITU-T L.EE_5G on **“Energy efficiency Metrics and measurement methodology for 5G base stations”.**
- Draft Recommendation ITU-T L.methodology_arch on **“Methodology to assess the environmental impact of the different proposed architectures”.**
- Draft Recommendation ITU-T L.ENV-KPI-5G-ARCH on **“Environmental KPIs/metrics for 5G architectures”.**
- Draft Recommendation ITU-T L.EE_sclicing on **“Energy efficiency and slicing of IMT2020/5G”.**
- Draft Recommendation ITU-T L.ARCH_EOL_CE on **“Environmental Impact of architecture solutions with regards to End of Life and Circular Economy (CE)”.**

Upcoming meeting

- **ITU-T Study Group 5 “Environment, Climate Change and Circular Economy” meeting**

  13-22 May 2019, Geneva, Switzerland

Thank you!

For more information please contact: tsbsg5@itu.int

Additional slides

ITU-T K. Suppl. 10
Analysis of EMC aspects and definition of requirements for 5G systems

This Supplement provides guidance on the EMC compliance assessment considerations for 5G systems. Given the 5G Radio Access Network (RAN) technical standards are still being finalised, the first version of this Supplement focuses on possible emission and immunity requirements for 5G systems.

ITU-T K. Suppl. 8
Resistibility analysis of 5G systems

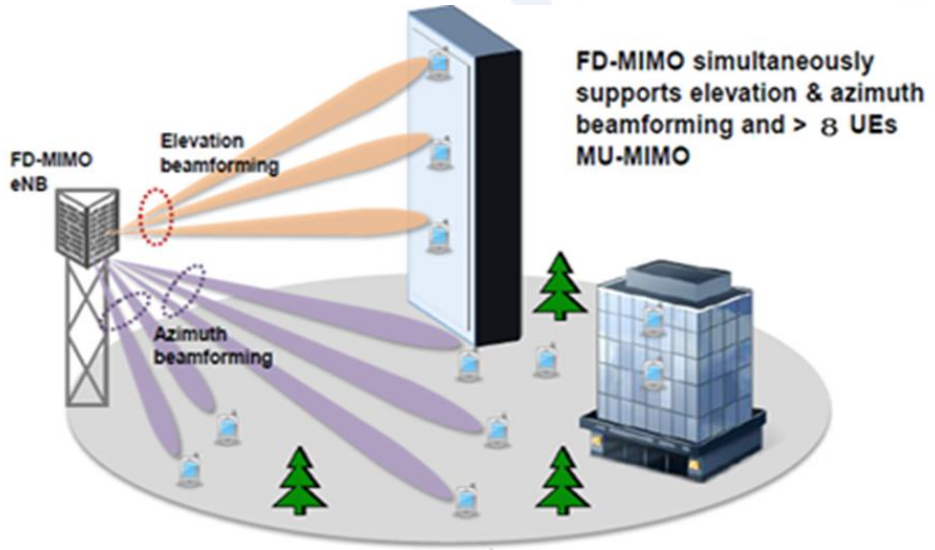
This Supplement analyses 5G system resistibility requirements for lightning and power fault events. The electrical threats posed by lightning and power fault events are discussed and the appropriate resistibility tests identified. Installation practice can have a big influence on the reliability of service and the equipment. Earthing, location and craftmanship are discussed.

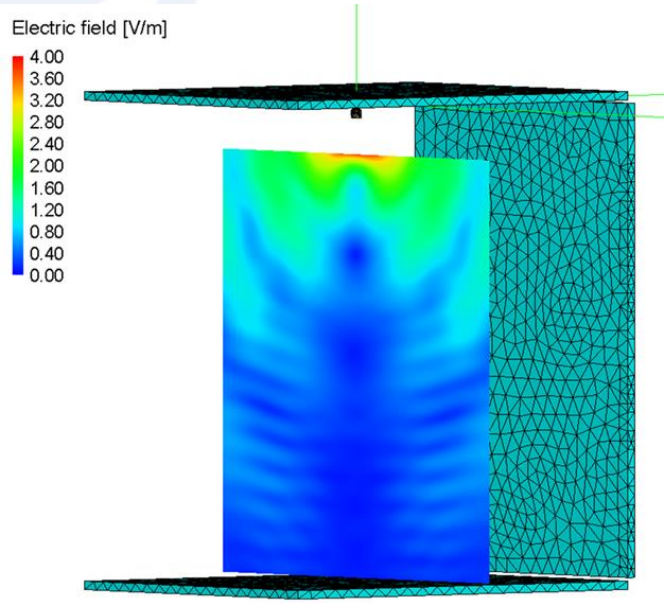
ITU-T K. Suppl. 9

5G technology and human exposure to RF EMF

Contains an analysis of the impact of the implementation of 5G mobile systems with respect to exposure level of EMF around radiocommunication infrastructure

- **Higher frequencies and higher throughput**
- **Smart antennas:** will be more efficient which will result in minimized RF-EMF exposure
- **Small cells:** are well suited for coverage extent as well as capacity issues. Better quality and reduced power to and from mobile phones.
- **Internet of things (IoT):** EMF exposure will usually be much lower than from other devices and systems

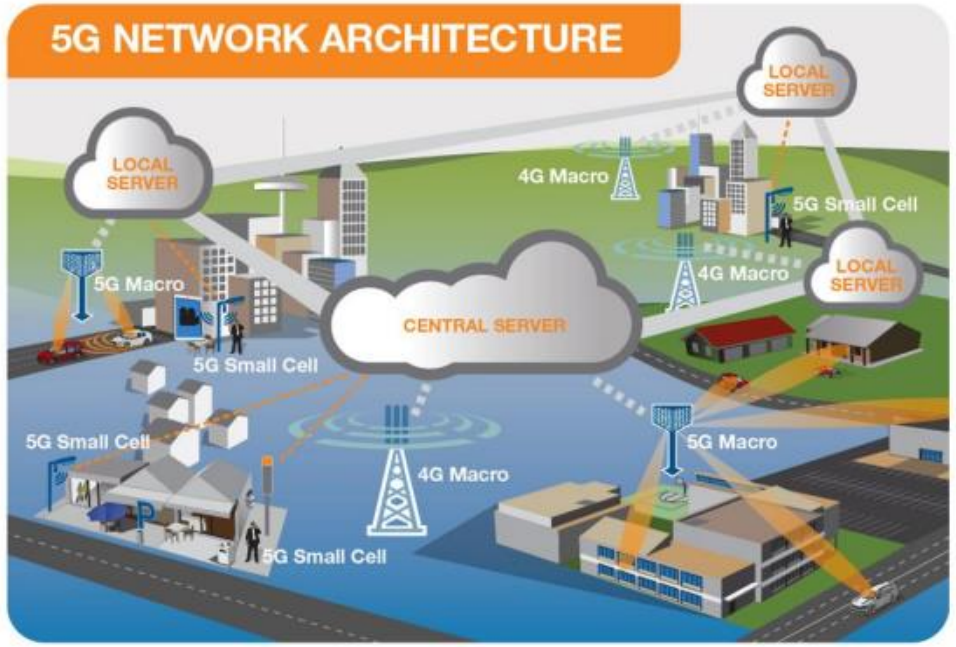




ITU-T K.Suppl.14
The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment

- Provides an overview of some of the challenges faced by countries, regions and cities which are about to deploy 4G or 5G infrastructures.
- Includes a case study on Poland
- Based on inputs and contributions from, inter alia, Poland, India, Ericsson, Nokia, China Telecom, Huawei, Uganda, Cisco, GSMA and Vodafone, Telstra, Korea, Belgium, etc.

ITU-T K.Suppl.16
"Electromagnetic field (EMF) compliance assessments for 5G wireless networks"



This Supplement provides guidance on the RF-EMF compliance assessment considerations for IMT-2020 wireless networks also called as 5G. The first version of this Supplement is addressing mainly the computational assessment options and assessments of trial networks.

Recommendation ITU-T L.1220
Innovative energy storage technology for stationary use - Part 1: Overview of energy storage

This Recommendation introduces an open series of documents for different families of technologies (battery systems, super-capacitor systems, etc.) that will be enriched progressively as new technologies emerge that may have a possible significant impact in the field of energy storage.

Recommendation ITU-T L.1221
Innovative energy storage technology for stationary use - Part 2: Battery

This Recommendation introduces technologies and methods for evaluating, selecting and testing battery systems for defined applications.

Recommendation ITU-T L.1222
Innovative energy storage technology for stationary use - Part 3: Supercapacitor technology

This Recommendation contains selection criteria for telecommunication application based on main performance parameters and the methods for proper use.

ITU-T L. Suppl.36
Study on methods and metrics to evaluate energy efficiency for future 5G systems

This Supplement analyses the energy efficiency issues for future 5G systems. The focus of this Supplement is on methods and metrics to measure energy efficiency in 5G systems, with consideration of the degree of stability of the systems known so far and the experience of the legacy systems as well as related measurement procedures for evaluating future standardization evolutions.