

**ITU-T activities on
Human exposure to
electromagnetic fields
(EMFs)
due to radio systems
and mobile equipment**

The International Telecommunication Union (ITU)



ITU:
International Telecommunication Union
– the UN specialized agency for ICTs



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



FG-AI4EE: Focus Group on
Environmental Efficiency for
Artificial Intelligence & Other
Emerging Technologies

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



○ Lead Study Group 5 Roles:

- electromagnetic compatibility, lightning protection and electromagnetic effects
- ICTs related to the environment, climate change, energy efficiency and clean energy
- circular economy, including e-waste

Q1/5 Protection of ICT infrastructure from electromagnetic surges

Q2/5 Equipment resistibility and protective components

Q3/5 Human exposure to electromagnetic fields (EMFs) from ICTs

Q4/5 EMC issues arising in the telecommunication environment

Q5/5 Security and reliability of ICT systems from EM and particle radiations

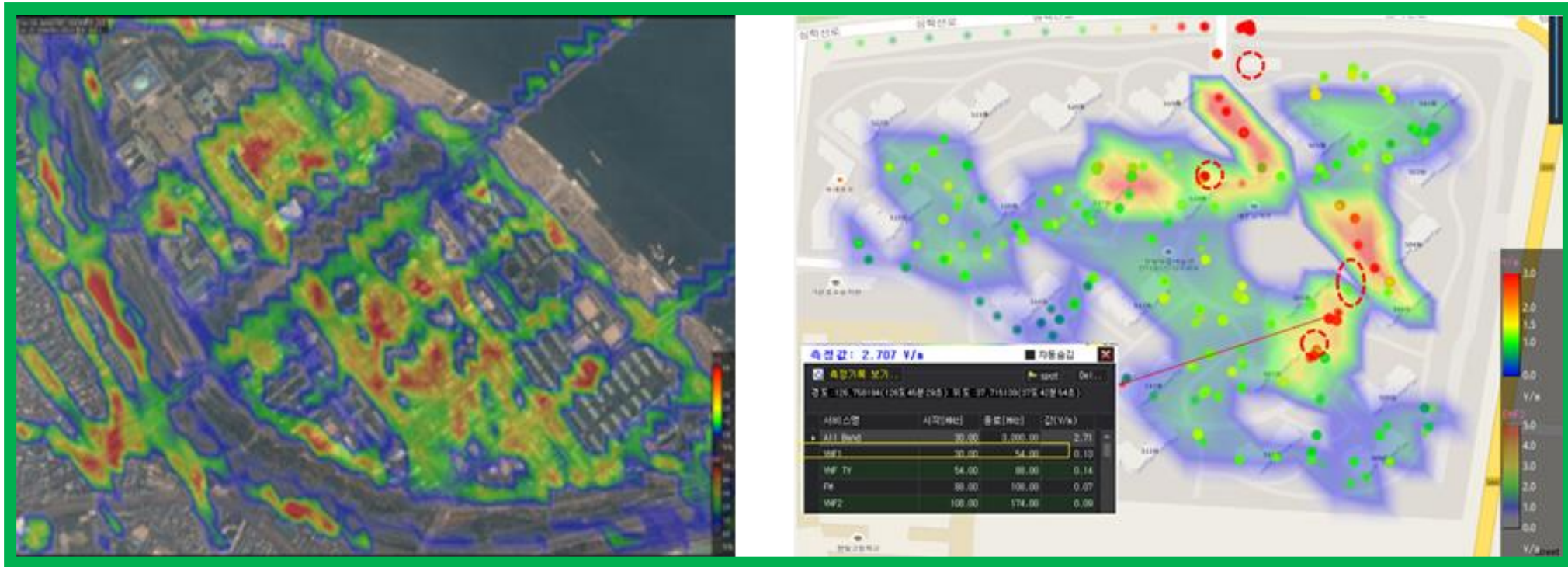
Q6/5 Achieving energy efficiency and smart energy

Q7/5 Circular economy including e-waste

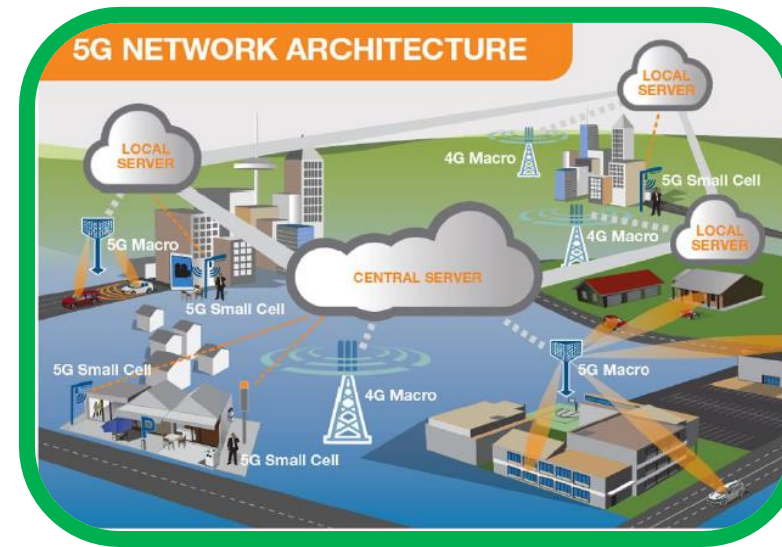
Q8/5 Guides and terminology on environment and climate change

Q9/5 Climate change and assessment of ICT in the framework of the SDGs

Updated Recommendation ITU-T K.91: Guidance for assessment, evaluation & monitoring of human exposure to radio frequency EMF



Accelerating sustainable digital transformation



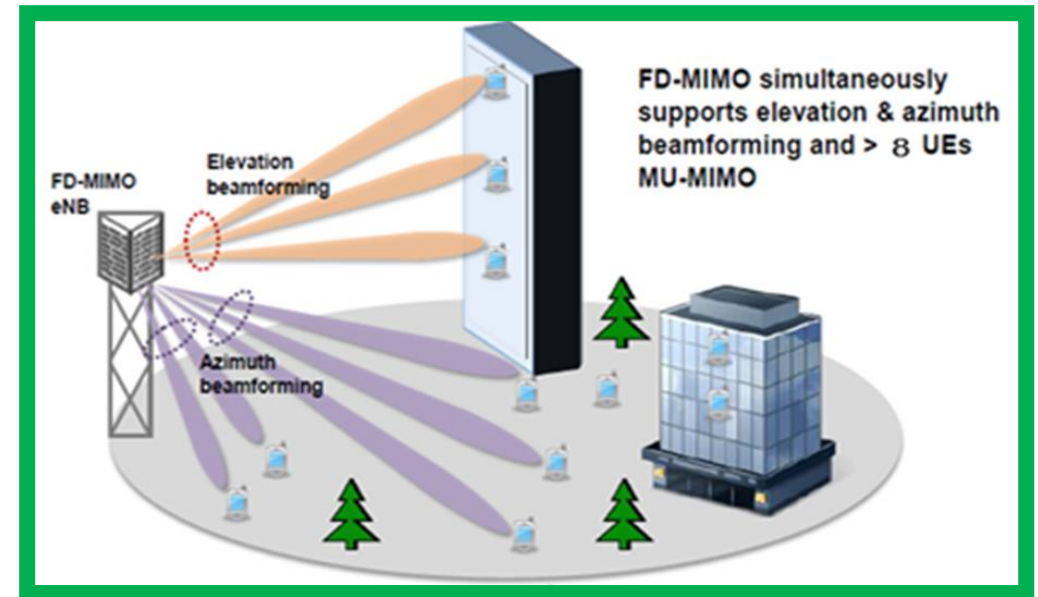
ITU-T K.Suppl.16: "Electromagnetic field compliance assessments for 5G wireless networks"

ITU-T K Suppl. 1 to K.91: "Guide on electromagnetic fields and health"

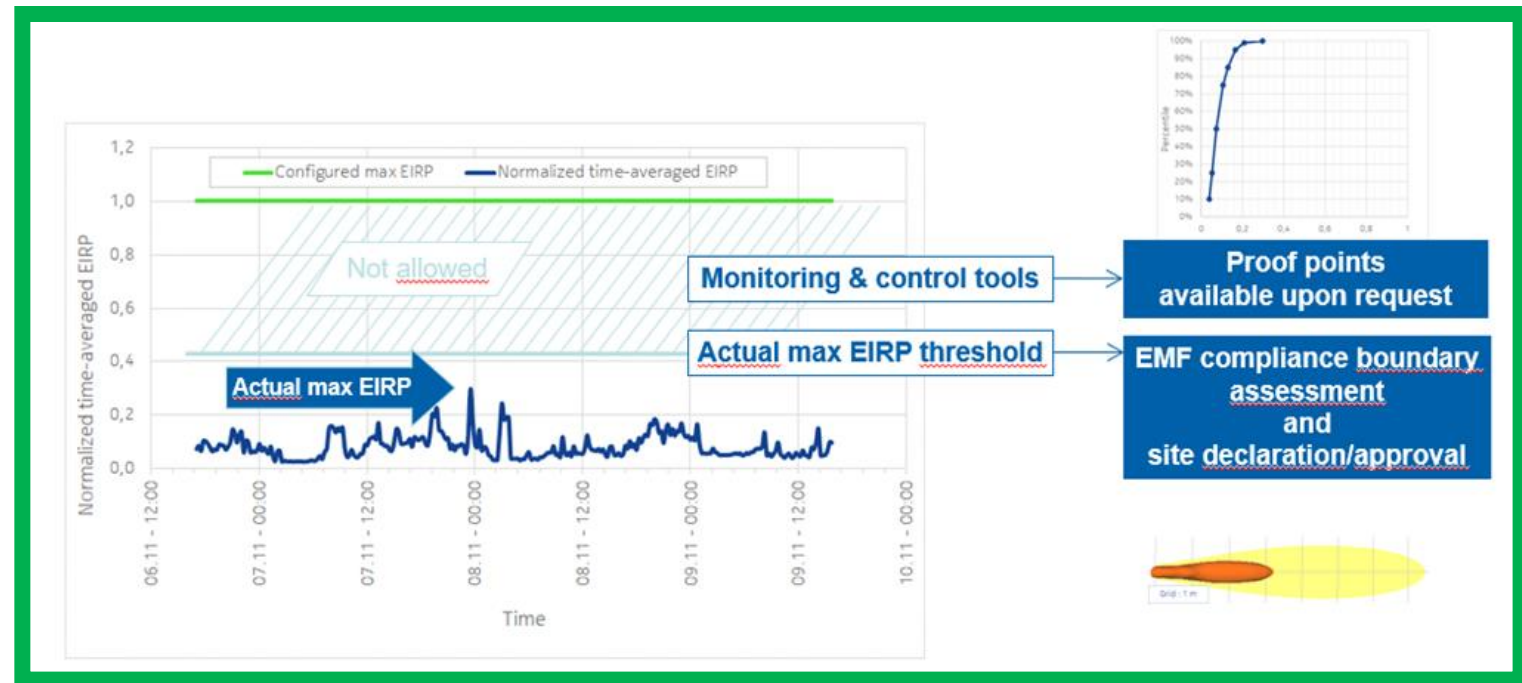
Updated K.Suppl 1 to Rec. ITU-T K.91: Guide on EMF and health

	1G 1980	2G 1990	3G 2003	4G 2009	5G 2020
SERVICES					
DEVICES					

K Suppl.1(20) F05



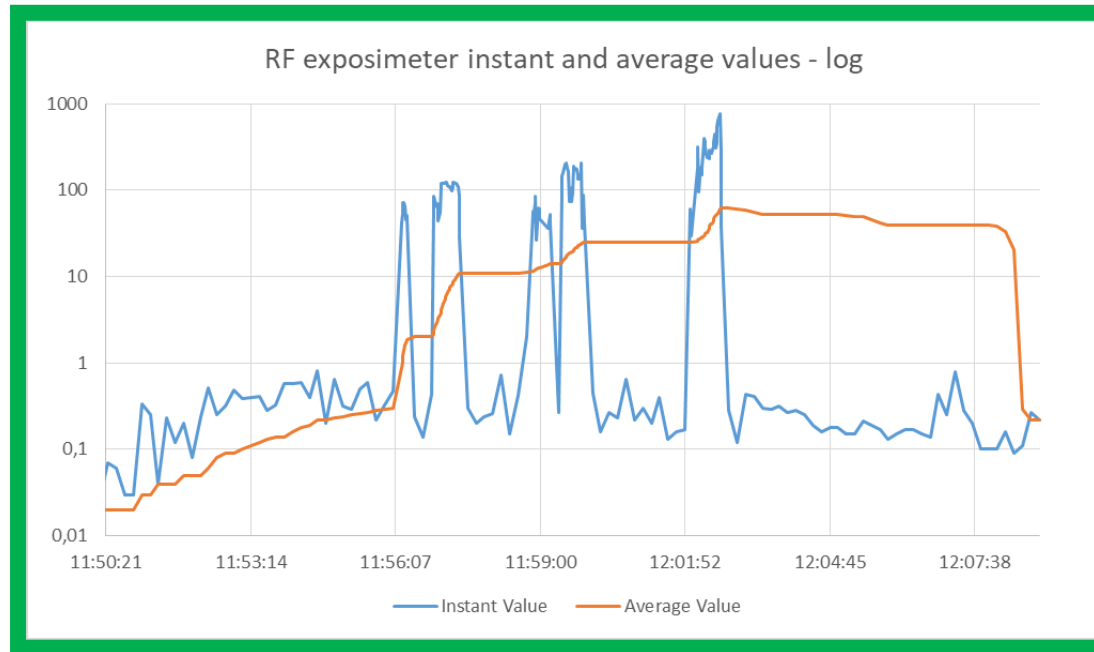
Updated Recommendation ITU-T K.100: Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service



Monitoring & control tools → Proof points available upon request

Actual max EIRP threshold → EMF compliance boundary assessment and site declaration/approval

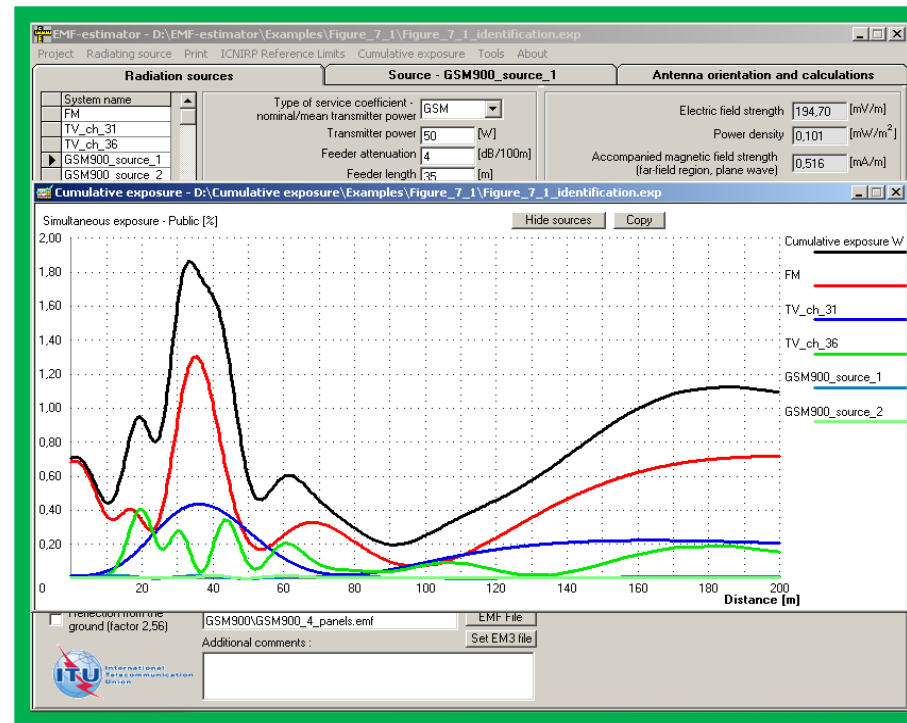
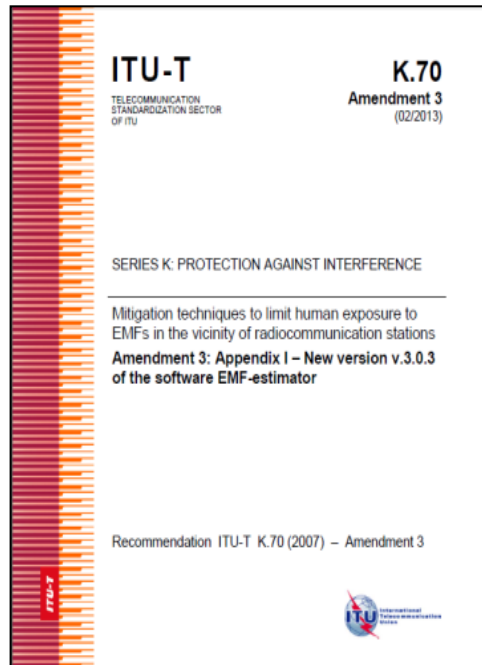
New Recommendation ITU-T K.145: Assessment and management of compliance with radio frequency electromagnetic field exposure limits for workers at radiocommunication sites and facilities



Updated Recommendation ITU-T K.83: Monitoring of EMF levels

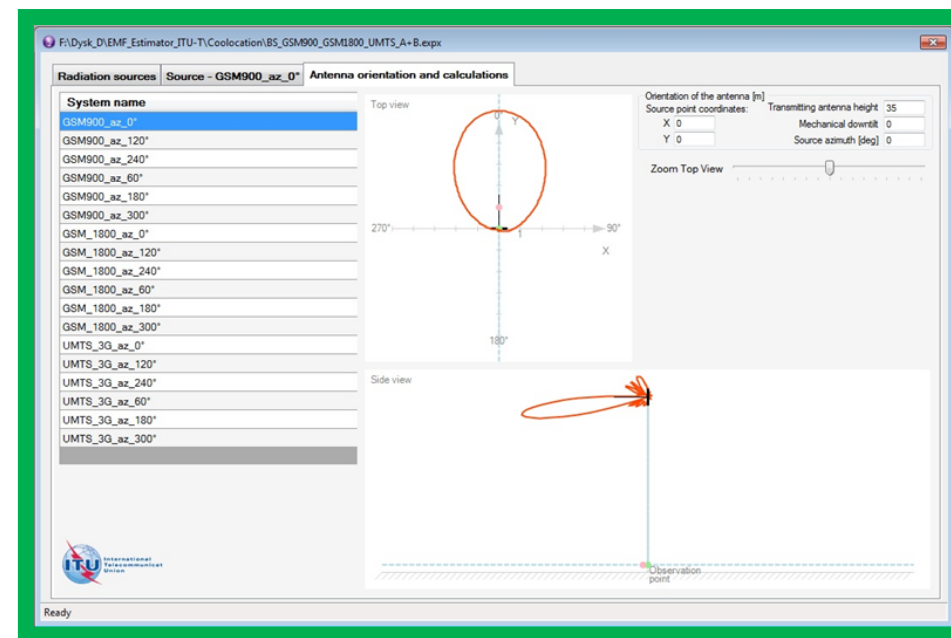


Updated Recommendation ITU-T K.70: Mitigation techniques to limit human exposure to EMFs in the vicinity of radiocommunication stations

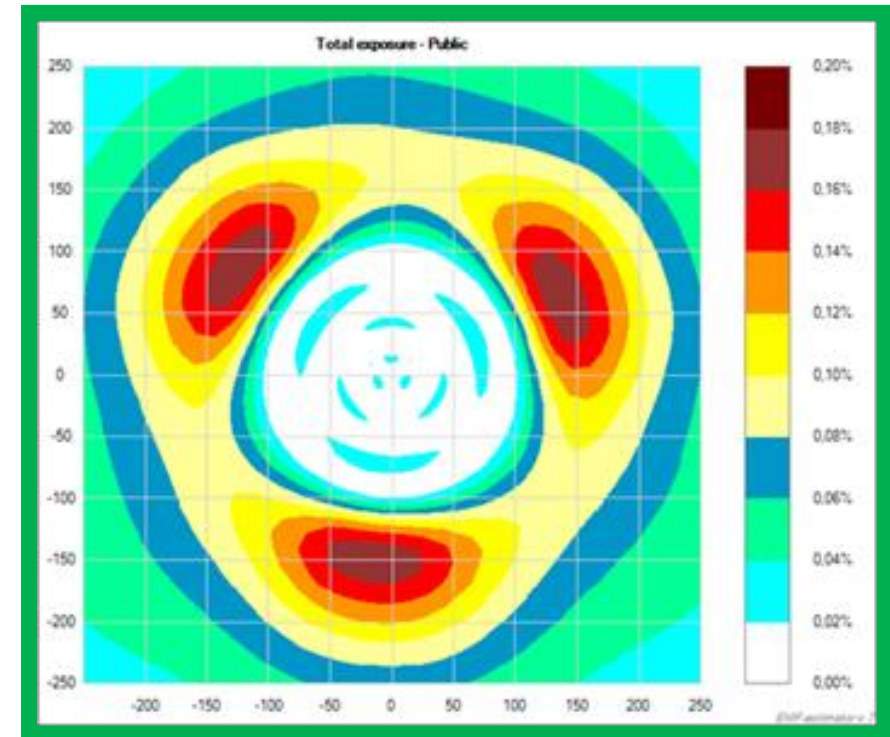
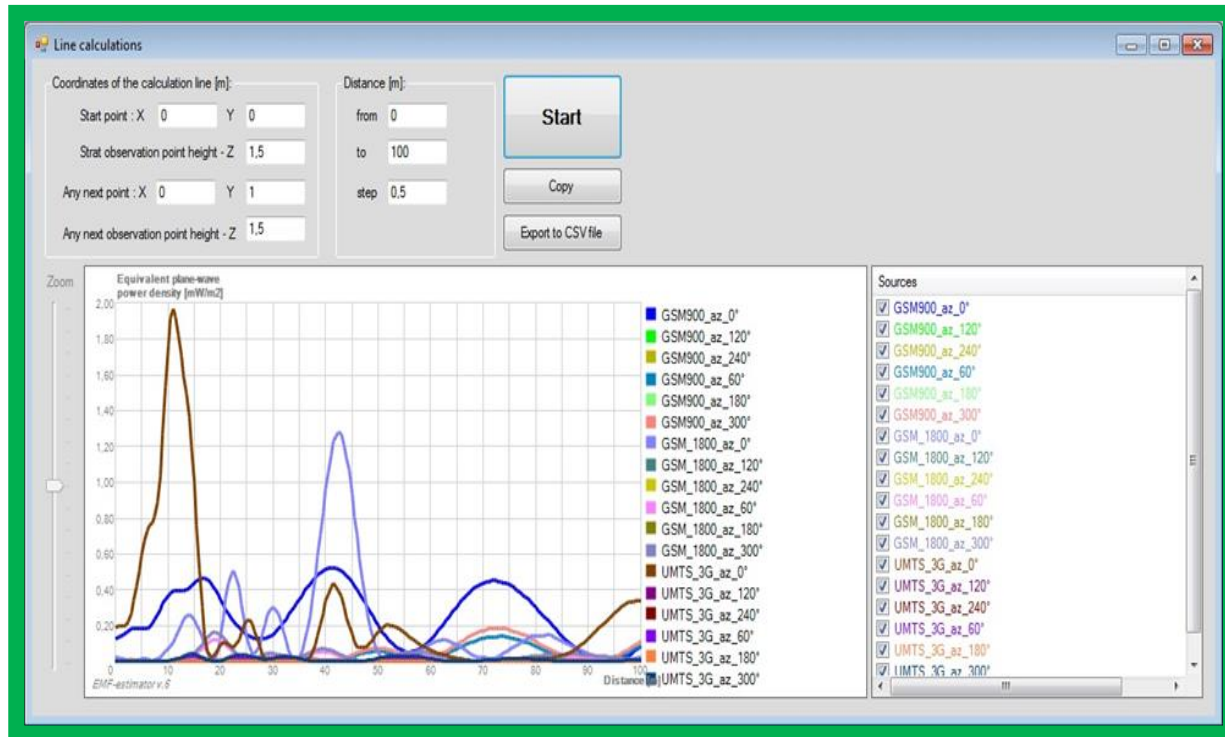


EMF-estimator

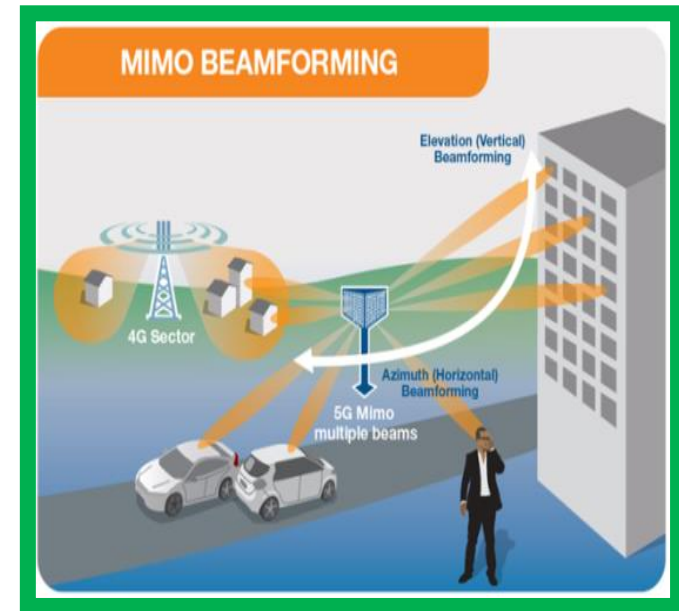
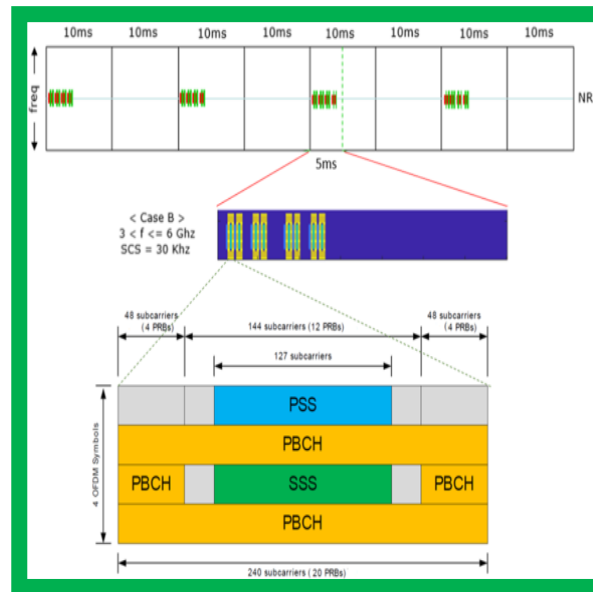
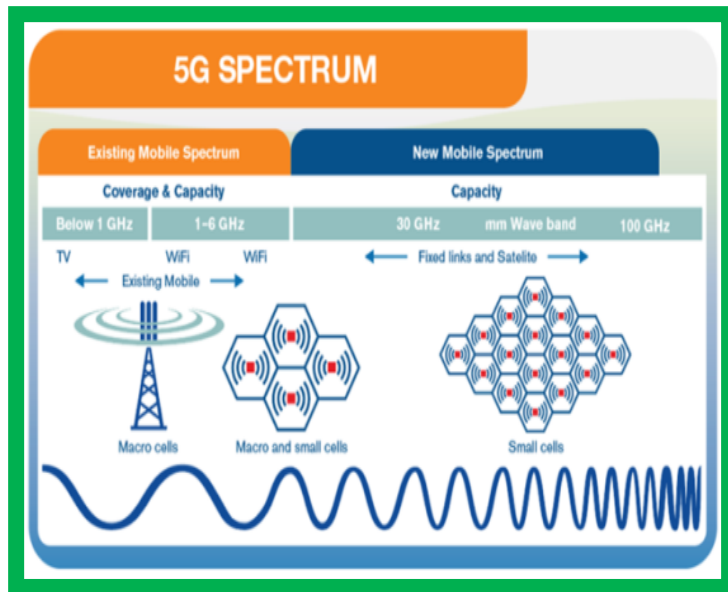
- Software tool that is Annex I to Recommendation ITU-T K.70
- The last version (v8.32 and v.1.64 - depending on the 32- or 64-bit Microsoft Access) may be loaded from:
 - <https://www.itu.int/rec/T-REC-K.70-201801-P>
 - <https://www.itu.int/rec/T-REC-K.70-201809-I!Amd2>



EMF-estimator



5G and Permissible Levels of Electromagnetic Fields in the Environment (PEM)

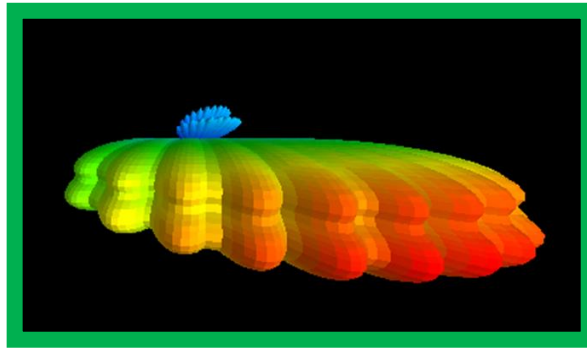


Advancing sustainable digital transformation and enhancing environmental protection further...

Question number	Question title
A/5	Electrical protection, reliability, safety and security of ICT systems
B/5	Protecting equipment and devices against lightning and other electrical events
C/5	Human exposure to electromagnetic fields (EMFs) due to digital technologies
D/5	Electromagnetic compatibility (EMC) aspects in ICT environment
E/5	Environmental efficiency of digital technologies
F/5	Climate change mitigation and smart energy solutions
G/5	E-waste, circular economy and sustainable supply chain management
H/5	Adaptation to climate change through sustainable and resilient digital technologies
I/5	Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement
J/5	Building circular and sustainable cities and communities
K/5	Guides and terminology on environment



Conclusions



Thank you!

Questions? Interested in learning more?
Let us know!



Email

tsbsg5@itu.int



Website

[SG5: Environment, climate change and
circular economy](#)

Revised and new ITU-T Recommendations (2017-2020)

ITU-T Rec. Number	Title	Year
K.52	Guidance on complying with limits for human exposure to electromagnetic fields	2017
K.61	Guidance to measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installation	2017
K.70	Mitigation techniques to limit human exposure to EMF's within vicinity of radiocommunication stations	2017/2020
K.83	Monitoring of the electromagnetic field levels	2020
K.90	Evaluation techniques and working procedures for compliance with exposure limits of network operator personnel to power-frequency electromagnetic fields	2018
K.91	Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields	2017/2018/ 2019/2020
K.100	Measurement of human exposure levels when a wireless installation is put into service	2017
K.145 (new)	Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities	2019/2020

Revised and new ITU-T Supplements (2017-2020)

Work item	Title	Year
K Suppl. 9	5G technology and human exposure to RF EMF	2017/2019
K Suppl. 13	Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use	2018
K Suppl. 14	The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment	2018/2019
K. Suppl. 4 to K.91	Electromagnetic field considerations in smart sustainable cities	2018
K Suppl. 16	Electromagnetic field (EMF) compliance assessments for 5G wireless networks.	2018/2019
K Suppl. 19	Electromagnetic field (EMF) strength inside underground railway trains	2019
K Suppl. 1 to K.91	Guide on electromagnetic fields and health	2020
K Suppl. 20	RF Exposure evaluation around base station installed underground	2020

Revised and new ITU-T Appendixes (2017-2020)

Work item	Title	Year
Appendix I to ITU-T K.70	Mitigation techniques to limit human exposure to EMF's within vicinity of radiocommunication stations	2018
Appendix II of ITU-T K.121	Guidance on the Environmental Management for Electromagnetic Radiation from Radiocommunication Base Stations	2018
Appendix V of ITU-T K.52	Guidance on complying with limits for human exposure to electromagnetic fields	2018
Appendix VIII to Rec. ITU-T K.91	Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields. Manhole type base station.	2018
Appendix IX to Rec. ITU-T K.91	Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields. EMF monitoring and information platform.	2018/2019
Appendix II of ITU-T K.90	Evaluation techniques and working procedures for compliance with exposure limits of network operator personnel to power-frequency electromagnetic fields. Description of the program EMFACDC.	2019