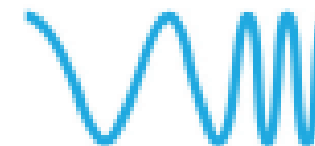


ITU-D Activities on Electromagnetic Fields

Jaroslav K. PONDER
Head of ITU Office for Europe

ITU Workshop on 5G, EMF and Health
5 December 2017, Warsaw, Poland



ITU framework on Electromagnetic Fields (EMF)

1. ITU Plenipotentiary Resolution 176 ([Rev. Busan, 2014](#)): *Human exposure to and measurement of electromagnetic fields*
2. ITU-T – [Resolution 72](#) on “Measurement concerns related to human exposure to electromagnetic fields”
3. ITU-D– [Resolution 62](#) (Rev. WTDC-174) on "Measurement concerns related to human exposure to EMF"
4. ITU-D Question [7/2](#) (Continuation of Q 23/1 and Q7/2) *Strategies and Policies Concerning Human Exposure To Electromagnetic Fields*
5. ITU-T SG5: Environment and Climate Change Question [C/5](#) (continuation of Q 3/5 and 7/5): Human exposure to electromagnetic fields (EMFs) due to radio systems and mobile equipment

Q7/2 Strategies and policies concerning human exposure to electromagnetic fields

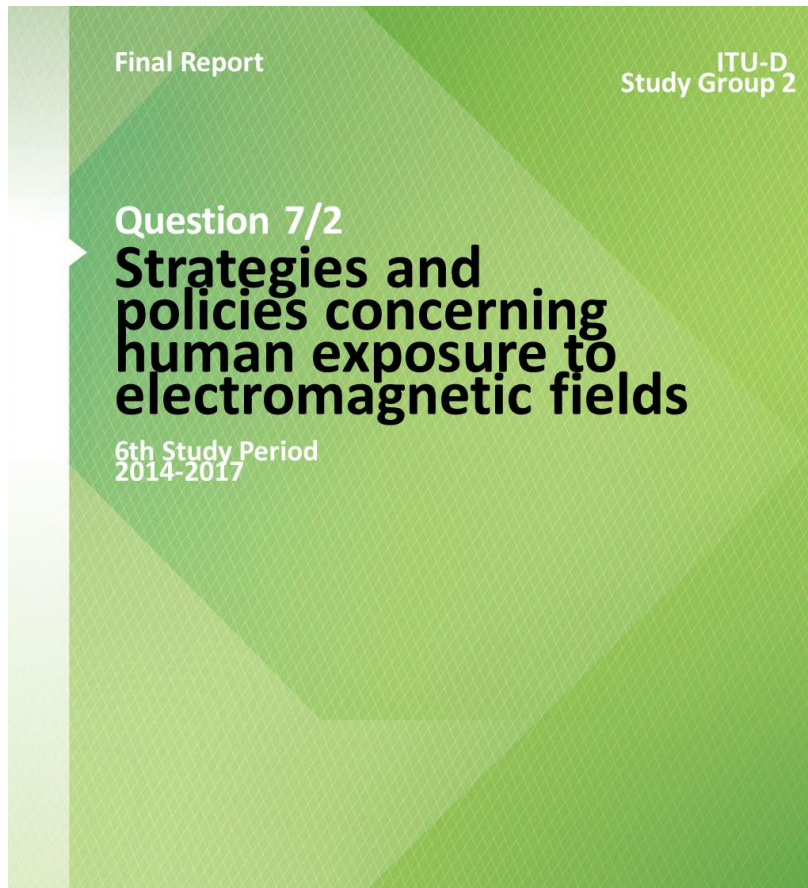
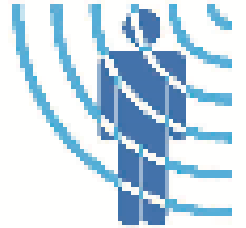
- Collects and disseminates information concerning exposure to radiofrequency (RF) and electromagnetic fields (EMF), in order to assist national administrations, particularly in developing countries, to develop appropriate national regulations.
- Useful for Administrations, in order to listen and respond to the concerns of public from radiating antennas.

Q7/2

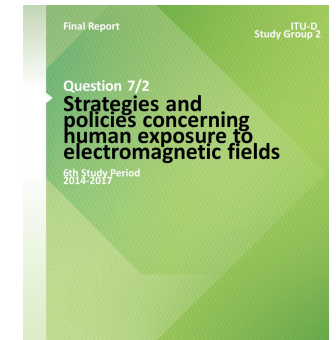
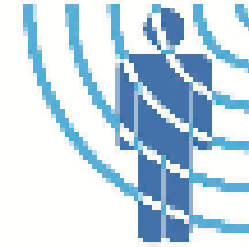


Final Report of Q7/2

Q7/2



- Question 7/2 – Strategies and policies concerning human exposure to electromagnetic fields
- This report collects and disseminates information concerning exposure to Radio Frequency (RF) and Electromagnetic Fields (EMF), in order to assist national Administrations, particularly in developing countries, to develop appropriate national regulations. It is useful for Administrations, in order to listen and respond to the concerns of the public related to radiating antennas.
- <https://www.itu.int/pub/D-STG-SG02.07.1-2017>



Final Report of Q7/2

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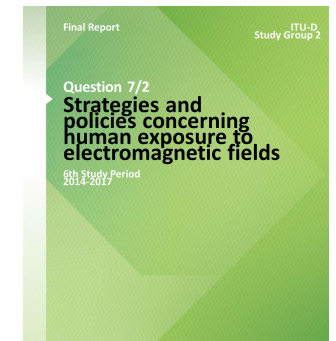
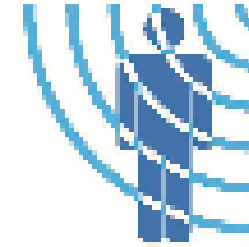
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Final Report of Q7/2

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Annex 7: Case studies

- The relationship between brain cancer and the introduction of mobile phones (Australia)
- Radiofrequency fields and health (Canada)
- Electromagnetic radiation online monitoring system (People's Republic of China)
- Online publication of the non-ionizing radiation measurements (Hungary)
- Regulation and research on EMF effects to human body (Republic of Korea)
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- Health effects of non-ionizing fields (New Zealand)
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- Protection against non-ionizing radiation (Switzerland)
- Human exposure to radio frequency fields from broadcast transmitters (United Kingdom)
- Advice on exposure to EMF in Wireless networks (Wi-Fi) environment (United Kingdom)



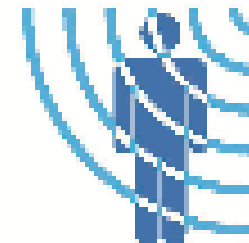
Study Group: Q7/2 beyond WTDC-17



- a. Compilation and analysis of the regulatory policies concerning human exposure to electromagnetic fields that are being considered or implemented for authorizing the installation of radiocommunication sites and the monitoring powerline telecommunication systems.
- b. Description of the strategies or methods for raising the awareness of populations and increasing information to populations regarding the effects of human exposure to electromagnetic fields due to radiocommunication systems.
- c. Proposed guidelines and best practices on this matter.
- d. What are the international (mainly in WHO, ICNIRP and IEEE) activities to provide updated limits of exposure levels.

➤ **Expected outcome:** The report will provide materials for workshops and seminars to share experiences on the establishment of limits for maximum exposure to non-ionizing electromagnetic radiation from radio base stations.

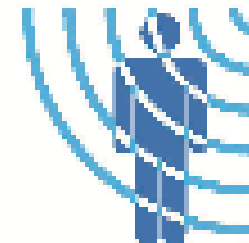
➤ **Sources of input:** Member States, Sector Members, Associates and Academia.



WTDC-17 on EMF: Res 64

- *resolves to instruct the Director of the Telecommunication Development Bureau*
- 2 to conduct international and regional seminars and workshops to identify the needs of developing countries and to build human capacity in regard to EMF including Specific Absorption Rate (SAR);
 - 4 to provide the necessary assistance to member states, in particular developing countries, by supplying them with measurement methods to assess human electromagnetic exposure, including methods to manage the risk perception by the public;
 - 5 to foster the exchange of experiences and best practices in connection with the challenges and opportunities of developing technical regulations on the adoption of limits for reference levels to non-ionizing electromagnetic radiation from radio frequency stations, as well as to specific absorption rate levels;
 - 6 to establish and keep up a dialogue among all interested parties, such as civil society, authorities, industry, the scientific community, associations, and the media, in order to provide support for measuring human exposure to electromagnetic fields and to adopt the regulatory framework on the reference levels for persons on the basis of the technical specifications drawn up by the international bodies specializing in human health and protection against non-ionizing radiation,
 - 7 to promote the EMF-estimator software that implement the methodology described in ITU-T K.70;
 - 8 to implement a necessary assistance to member states, in particular developing countries, by supplying them methods of measures allowing human electromagnetic exposure estimation quoted in the considering part b), in order to define a current situation regarding protection against electromagnetic exposure and its impact on current national regulations;





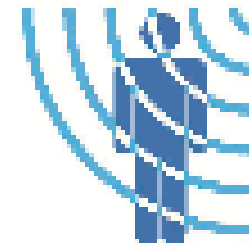
WTDC-17 on EMF: Res 64

➤ *instructs Study Group 2*

within the framework of its Questions, including Question 7/2, to cooperate with ITU-T Study Group 5 and ITU-R Study Groups 1, 4, 5 and 6, in order to achieve the following goals:

- i) to collaborate, with ITU-T Study Group 5 in particular, update the mobile application of the electromagnetic fields guide, on the subject of human exposure to EMF , and the implementation guidance as a matter of high priority;
- ii) contribute to the organization of seminars, workshops or trainings on the subject of EMF;
- iii) ensure wide dissemination of ITU publications and literature on EMF issues;
- iv) contribute to preparation of the Guide on the use of ITU-T publications on achieving electromagnetic compatibility and safety, and publications relating to measurement methodologies, the need for measurements to be performed by a "Qualified and Certified Radio Engineer or Technician" and the criteria for this "Qualified Radio Engineer or Technician", and system specifications,
- v) continue to cooperate with the World Health Organization (WHO), the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Institute of Electrical and Electronics Engineers (IEEE), and other relevant international organizations with regard to the awareness and dissemination of information to Membership and the public.





WTDC-17 on EMF: Res 64

➤ *invites Member States*

- 1 to conduct a periodic review concerning the performance of the operators and mobile equipment manufacturers in this field to make sure that they are following the national specifications or ITU Recommendations, in order to ensure the safe use of EMF;
- 2 to conduct public awareness campaigns on adverse impact of EMF and deploy successful solutions including regulations;
- 3 to continue to cooperate through exchange of experts, the organization of seminars, specialized workshops, and meetings;
- 4 to adopt international standards, and use effective methods for verifying compliance,



➤ *encourage Academia Members and Centres of excellence*

to participate actively in the work of this Resolution through the submission of contributions and proposals.

Regional Initiative for Europe: *Next Generation Regulation*

- EMF identified as one of the challenges requiring special attention of administrations and other stakeholders, in particular those involved 5G roll-out
- Two case studies
 - Acceptable Electromagnetic Field levels for cost-effective 5G implementation – Polish case study, Ministry of Digital Affairs, Poland
 - System for continuous EMF monitoring, RATEL, Serbia
- Request for Expert Meeting on EMF and 5G with European Focus
 - Outcomes to be submitted to all relevant study groups of ITU-D, ITU-T, ITU-R



Regional Initiative for Europe: Experts Meeting on EMF and 5G



- A [questionnaire](#) sent to European administrations prior to the expert meeting.
- Responses from **Croatia, Georgia, Hungary, Italy, Montenegro, Poland, Serbia, Switzerland, and Thailand**
- Key takeaways on
 - National exposure limits versus regional and global regulation
 - Impact of EMF exposure limits on planning of sites and the construction and/or operation of antennas
 - Approval procedures prior to building, planning permission procedures
 - Possible technical remedies
 - Factors are in your view central for the acceptability by the public of mobile broadband networks
 - Information campaigns regarding EMF protection

Regional Initiative for Europe: Experts Meeting on EMF and 5G

- In order to implement innovative and intelligent solutions, based on 5G networks, efforts should be made to guideline a coherent approach for the standardized EMF levels across the ITU countries.
- Taking into account present variety of EMF levels across the ITU countries, it should be estimated in various scenarios which EMF levels will grant the minimum requirements for the 5G establishment.
- Exchange of good practices in the field of social information campaigns on increased power limits and their environmental impact is required.
- Information from the Republic of Poland on the electromagnetic field levels in the context of anticipated implementation of 5G. Exposure limit such as 0.1 W/m^2 may lead to the following consequences:
 - Limited range of the base station grids.
 - The necessity to build much denser net of base stations (cost inefficient) and thus enforce increase of oversized investments costs.
 - Inability to share with existing technologies.



What Next?

- The outcomes of this experts' meeting will be brought to the attention of the study groups of ITU-D, ITU-R and ITU-T.
- ITU possesses the expertise for compliance measurements and calculations. It is a joint effort of all the sectors of ITU and each has to contribute.
 - Academia should be urged to continue to contribute to discussion in ITU through any of the sector (-R, -D, or -T)
 - Realistic methods for compliance assessment with EMF exposure limits
- Establish mechanisms for future collaboration between countries, and country case studies.
- Proposed studies to be included in ITU-D SG Question 7/2 (revised by WTDC-17)
 - Preparation of guidelines and case studies on public awareness on EMF issues
 - A guideline for a coherent approach for the standardized EMF levels across the ITU countries was called for.
 - Suggestions for communication, education, and information strategies in order to address public concern regarding human exposure to EMF and possible health effects would be welcome.
 - Compilation of good practices of local community communications and perception management.
 - Investigate utilization of ITU Interactive Transmission Map for EMF level



What Next?



- Request WHO to revise its backgrounder on EMF exposures and wireless networks in view of 5G Roll-out
- Meeting of relevant ITU and WHO experts in 2018
 - Pursuing contribution to the relevant WHO meetings
- ITU-T EMF guide update in view of 5G roll out
- Investigate possible avenues for adjusting compliance processes for EMF level in countries where there are significant local differences between the theoretical and the actual exposure levels
- Contribution to the on-going studies within ITU-R Working Party 1C in response to Question ITU-R 239/1 on “Electromagnetic field measurements to assess human exposure” <http://www.who.int/entity/peh-emf/publications/facts/fs304/en/index.html>



Thank You !!!

Jaroslav K. PONDER

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Provisional Final Report

World Telecommunication Development Conference (WTDC-17)

Buenos Aires, Argentina, 9-20 October 2017



ITU Regional Initiative for Europe

- **EUR1: Broadband infrastructure, broadcasting and spectrum management**
- **Objective:** To facilitate high-speed connectivity with resilient and synergistic infrastructure development, deployment and sharing, whilst ensuring a trusted and quality user experience. Expected results Assistance to the countries in need in the following:
 1. Development of plans (national and regional) and feasibility studies for deployment of ubiquitous resilient high-speed connectivity, including 5G/IMT2020 and digital broadcasting deployment, with all relevant components including legislation, standards, organizational set-up, capacity building and cooperation mechanisms, as needed
 2. Sharing of guidelines on collaborative regulation between the telecommunication sector and other synergistic sectors such as energy, railway and transportation
 3. Assessment of dynamics, challenges and opportunities in respect of the roll-out of diverse broadband technologies across Europe in the context of the creation of ubiquitous resilient high-speed broadband infrastructure
 4. Sharing of best practices and case studies in cable TV, digital broadcasting, 5G experience, early use cases and trends in next-generation access network roll-out
 5. Mapping of the ubiquitous infrastructure and services, fostering harmonization of approaches across the region and taking into account infrastructure-sharing approaches applied by countries
 6. Establishment of quality-of-service systems and consumer-protection frameworks
 7. Development of plans for ICT for sustainable energy covering different types of ICT applications and innovations.

TECHNOLOGY & NETWORK DEVELOPMENT



- Output 2.1 – Products and services on telecommunication/ICT infrastructure and services, wireless and fixed broadband, connecting rural and remote areas, improving international connectivity, bridging the digital standardization gap, conformance and interoperability, spectrum management, monitoring, and the effective and efficient management and proper use of telecommunication resources, within the mandate of ITU, and the transition to digital broadcasting, such as assessment studies, publications, workshops, guidelines, and best practices.
- Assist ITU Member States and ITU D Sector Members and Associates in maximizing the use of new technologies for the development of their information and communication infrastructures and services and building global Telecommunication/ICT infrastructure
- Facilitating the adoption of efficient technological solutions for ICT infrastructure development.
- Relevant WTDC Resolutions: 11, 15, 17, 18, 20, 21, 30, 37, 43, 47, 52, 63, 77, 79, COM3-1 and COM3-2
- Relevant Study Question: Question 1/1, 2/1, 5/1, 4/2
- Relevant Regional Initiatives: AFR2, AMS2, AMS3, ARB4, ASP3, CIS3, CIS5, EUR1

TECHNOLOGY & NETWORK DEVELOPMENT

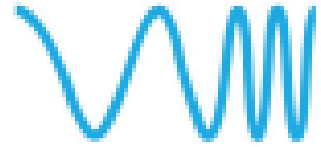


Implementation Framework

Programme: Telecommunication/ICT network infrastructure and services

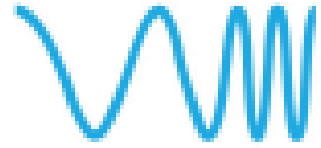
- Next-generation networks, including ICT networks for smart grids and future networks
 - Migration to NGN; new technology adoption; smart grid; management of telephone numbering resources
- Broadband networks: Wired and wireless technologies, including International Mobile Telecommunications (IMT), satellite communications and support for Internet of Things (IoT)
 - ICT broadband network plans, specially for IMT-2020 (5G); data collection of broadband backbone; ITU Interactive Transmission Maps; IXPs, transition to IPv6, development of new ecosystems for IoT
- Rural communications
 - Information on technologies for access, backhaul, power supply, satellite, and business models for financial and operational sustainability
- Bridging the digital standardization gap
 - Implementation of ICT standards; assistance for setting-up regional standardization bodies
- Conformance and interoperability
 - Cooperation with Conformity Assessment Bodies; capacity building on C&I programmes and testing; implementation of MRAs; combating counterfeit, sub-standard, and tampered telecommunication/ICT devices; combating mobile theft
- International Connectivity
 - Demands and best practices for international connectivity

SPECTRUM MANAGEMENT



- Strengthen national regulatory bodies in frequency planning and assignment, management and monitoring.
- Continuing to maintain, update and expand the Spectrum Management System for Developing Countries (SMS4DC) software, providing technical assistance and conducting training activities for its deployment and use;
- Providing spectrum-management assessments, master plans and recommended action plans for the further development of spectrum-management structures, procedures and tools, including new spectrum-sharing approaches;
- Providing assistance on spectrum fee regimes, including direct assistance in the establishment of such regimes; in the harmonization of regional spectrum allocations, including coordination procedures in border areas; and in the optimization and cost-effective use of spectrum-monitoring systems and networks.
- Assisting in EMF issues
- Relevant Resolutions: Resolution 9, 10 and 62
- Relevant Study Question: Question 7/2

BROADCASTING



- Providing assistance in transition from analogue to digital terrestrial television broadcasting and digital to digital, follow the post-transition activities, such as the introduction of new broadcasting services and allocation of the digital dividend.
- Providing assistance on policy and regulatory frameworks for digital terrestrial broadcasting, including frequency planning and optimization of spectrum use; digital broadcasting guidelines and master plans for the transition from analogue to digital broadcasting and new broadcasting services and technologies;
- Organizing regional meetings between ITU members on the use of spectrum for broadcasting services and other services.
- Relevant Study Question: Question 2/1



Thank you

