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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2017-2020 | | | | TSAG-TD1195 |
| **TSAG** |
| **Original: English** |
| **Question(s):** | | N/A | | | E-Meeting, 10-17 January 2022 |
| **TD (Ref.:** [SG5-LS255](http://handle.itu.int/11.1002/ls/sp16-sg5-oLS-00255.docx)) | | | | | |
| **Source:** | | ITU-T Study Group 5 | | | |
| **Title:** | | LS on ITU-T Study Group 5 Lead Study Group Report [from ITU-T SG5] | | | |
| **Purpose:** | | Information | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | | - | | |
| **For comment to:** | | | - | | |
| **For information to:** | | | TSAG | | |
| **Approval:** | | | ITU-T Study Group 5 management team (20 December 2021 by correspondence) | | |
| **Deadline:** | | | N/A | | |
| **Contact:** | | | Shuguang Qi  Acting Chairman ITU-T SG5 | Tel: +86 10 82053589-8858 E-mail: [qishuguang@caict.ac.cn](mailto:qishuguang@caict.ac.cn) | |
| **Contact:** | | | Fryderyk Lewicki Chairman of WP1/5 | Tel: +48 71 321 09 24 E-mail: [fryderyk.lewicki@orange.com](mailto:fryderyk.lewicki@orange.com) | |
| **Contact:** | | | Paolo Gemma Chairman of WP2/5 | Tel: +39 02 3999 4947 Fax: +39 01119743499 Email: [paolo.gemma@huawei.com](mailto:paolo.gemma@huawei.com) | |

A new liaison statement has been received from SG5.

This liaison statement follows and the original file can be downloaded from the ITU ftp server at <http://handle.itu.int/11.1002/ls/sp16-sg5-oLS-00255.docx>.

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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2017-2020 | | | | **SG5-LS255** | |
| **STUDY GROUP 5** | |
| **Original: English** | |
| **Question(s):** | | | All/5 | |  | |
| **LIAISON STATEMENT** | | | | | | |
| **Source:** | | | ITU-T Study Group 5 | | | |
| **Title:** | | | LS on ITU-T Study Group 5 Lead Study Group Report | | | |
| **LIAISON STATEMENT** | | | | | | |
| **For action to:** | | | | - | | |
| **For comment to:** | | | | - | | |
| **For information to:** | | | | TSAG | | |
| **Approval:** | | | | ITU-T Study Group 5 management team (20 December 2021 by correspondence) | | |
| **Deadline:** | | | | N/A | | |
| **Contact:** | | Shuguang Qi  Acting Chairman ITU-T SG5 | | | | Tel: +86 10 82053589-8858 E-mail: [qishuguang@caict.ac.cn](mailto:qishuguang@caict.ac.cn) |
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| **Contact:** | | Paolo Gemma Chairman of WP2/5 | | | | Tel: +39 02 3999 4947 Fax: +39 01119743499 Email: [paolo.gemma@huawei.com](mailto:paolo.gemma@huawei.com) |

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| **Keywords:** | SG5; lead roles; electromagnetic compatibility; lightning protection; electromagnetic effects; ICTs; environment; climate change; energy efficiency; circular economy; e‑waste; |
| **Abstract:** | This liaison statement informs TSAG on SG5 lead roles and gives an update on SG5 activities from 16 October until 16 December 2021. |

ITU-T Study Group 5 is actively fulfilling its mandate as the lead study group on electromagnetic compatibility, lightning protection and electromagnetic effects; ICTs related to the environment, climate change, energy efficiency and clean energy and circular economy, including e‑waste.

# 1 Main achievements

The list of results pertaining to ITU-T SGs Recommendations on electromagnetic compatibility, lightning protection and electromagnetic effects; ICTs related to the environment, climate change, energy efficiency and clean energy and circular economy, including e‑waste, since January 2021, are provided in Annex 1 (status: until 10 December 2021).

The main highlights are described in the following text.

**Working Party 1/5** experts consented eight revised Recommendations: ITU-T K.124 “Overview of particle radiation effects on telecommunication systems”, ITU-T K.130 “Neutron irradiation test methods for telecommunication equipment”, ITU-T K.131“Design methodologies for telecommunication systems applying soft error measure”, ITU-T K.138 “Quality estimation methods and application guidelines for mitigation measures based on particle radiation tests”, ITU-T K.139 “Reliability requirements for telecommunication systems affected by particle radiation”, ITU-T K.83 “Monitoring of the electromagnetic field levels”, ITU-T K.91 “Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields”, ITU-T K.137 “Electromagnetic compatibility requirements and measurement methods for wireline telecommunication network equipment”.

One new Recommendation was consented: ITU-T K.151 “Electrical safety and lightning protection of medium voltage input and up to ±400VDC output power system in ICT data centre and telecommunication centre”. The aim of this Recommendation is to establish clear requirements on this system performance such as safety, energy efficiency, and input-output characteristics, environmental aspects, and monitoring so as to promote safe, reliable, energy-efficient and green operation and maintenance of power feeding system in data centre and telecommunication room.

Additionally, experts discussed the comments received during the LC period of the AAP for draft revised Recommendation ITU-T K.147. During the SG5 meeting (virtual, 30 November – 10 December 2021), the additional review text for ITU-T K.147 was agreed and it is currently under the AAP.

Two Supplements were revised and agreed: K.Suppl.13 to Recommendation ITU-T K. “Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use”, and K.Suppl.20 to Recommendation ITU-T K. “Supplement on radiofrequency exposure evaluation around underground base stations”

WP1/5 experts also agreed to revised Appendix 1: Software "EMF-estimator" v8.0.32 and v8.64 to Recommendation ITU-T K.70 in order to provide more guidance on how to install the software.

Under the umbrella of **Working Party 2/5**, experts consented one revised Recommendation: ITU-T L.1331 “Assessment of mobile network energy efficiency”.

Three new Recommendations were consented: ITU-T L.1035 “Sustainable Management of Batteries”, ITU-T L.1016 “Method for Evaluation of the Environmental, Health and Safety Performance of True Wireless Stereo Headphones", and ITU-T L.1036 “Scheduled waste management for base station (inclusive of e-waste)".

Two new Supplements were agreed: L.Suppl.45 “Radio base station site best practices”, and L.Suppl.46 “Definitions and Recent Trends in Circular Cities”.

**2 Plan of work for this study period and towards the next study period and progress**

The list of Recommendations and other texts on electromagnetic compatibility, lightning protection, electromagnetic effects, environment, climate change, energy efficiency, clean energy and circular economy, including e-waste that are currently under development in ITU-T SG5 can be found at: <https://www.itu.int/ITU-T/workprog/wp_search.aspx?isn_sp=3925&isn_sg=3928&isn_status=-1,1,3,7&details=0&field=acdefghijo>

**3 SG5 as Lead Study Group on electromagnetic compatibility lightning protection and electromagnetic effects; ICTs related to the environment, climate change, energy efficiency and clean energy and circular economy, including e‑waste**

**3.1 Electrical protection, reliability, safety and security systems**

The protection, reliability, safety and security of ICT systems is studied by Question 1/5. The reliability of infrastructure is essential for stability of society. The purpose of this Question is to produce new or revised Recommendations or Supplements regarding the protection of telecommunication systems against the effects of nearby lightning strikes, disturbances from nearby electric power systems.

Q1/5 is currently working on five work items.

**3.2 Protecting equipment and devices against lightning and other electrical events**

The resistibility and safety applied to telecommunications equipment and infrastructure is studied by Question 2/5. The purpose of this Question is to produce new or revised Recommendations or Supplements regarding the resistibility of ICT equipment and also specifications, test methods and principles of application for protective components and assemblies.

Q2/5 is currently working on four work items. During the last SG5 meeting, experts agreed to start working on draft Recommendation ITU-T K.ecl “Surge protective component application guide - Electronic Current Limiters”.

**3.3 Human exposure to electromagnetic fields (EMFs) due to digital technologies**

The EMF aspect of ICTs and digital technologies is studied by Question 3/5. The purpose of this Question is to develop international standards and guidelines relating to assessment of human exposure to electromagnetic fields (EMF) produced by ICT installations and devices, including cellular phones and base stations; concerning construction and maintenance, use of radiocommunication installations and proper use of devices and information on factors affecting exposure from transmitting stations and mobile devices in order to assure compliance with RF EMF limits. These Recommendations and guidelines should provide appropriate support to countries in establishing national regulations concerning assessment and compliance of RF EMF exposure. The Question will also develop standards, technical papers and methodologies for compliance with exposure limits of general public and workers to electromagnetic fields.

Q3/5 is currently working on seven work items. During the last SG5 meeting, experts agreed to start working on draft Supplement ITU-T K.Suppl.WPT “EMF strength in and outside of WPT-EV/OLEV”.

**3.4 Electromagnetic compatibility (EMC) aspects in ICT environment**

The EMC aspects in ICT environment is studied by Question 4/5. The electromagnetic environment is changing rapidly through the development and installation of new types of electric/electronic equipment and evolving the telecommunication infrastructure. This Question aims to establish the EMC requirements including emission and immunity requirements for ICT equipment, and countermeasures for facilities to reduce electromagnetic compatibility issues and maintain a controlled electromagnetic environment for ICT systems and services.

The Question is closely in collaboration with ITU-R SG1, SG5 and SG6, ITU-T SG9, IEC ACEC (Advisory Committee on Electromagnetic Compatibility), IEC CISPR and SC77B.

Q4/5 is currently working on six work items. During the last SG5 meeting, experts agreed to start working on the revision of Recommendation ITU-T K.76 “EMC requirements for telecommunication network equipment (9 kHz-150 kHz)”.

**3.5 Environmental efficiency of digital technologies**

The environmental performance and efficiency aspects of digital and frontier technologies are studied under Question 6/5. These technologies are capable of unlocking the next level of efficiency for the public and manufacturing sector while accelerating progress on the SDGs. However, the environmental performance of digital and frontier technologies themselves is often overlooked. This Question identifies the environmental efficiency requirements of digital and frontier technologies, including their water, materials, and energy efficiency. It focuses on studying technical solutions, enhancements, metrics, key performance indicators and related accurate measurement methods and reference values for different type of technologies.

Q6/5 is currently working on eighteen work items. During the last SG5 meeting, experts agreed to start working on draft Recommendation ITU-T L\_NCIe “Carbon data intensity for network energy performance monitoring” and draft Supplement ITU-T L.Sup.EMUE “Energy related mobile end-user experience”

Q6/5 agreed to adopt two FG-AI4EE Technical Reports into draft Supplement ITU-T L.Suppl.cdep “Computer processing, data management and energy perspective” and ITU-T L.Suppl.gcai “Guidelines on the Implementation of Eco-friendly Criteria for AI and other Emerging Technologies”.

**3.6 E-waste, circular economy and sustainable supply chain management**

The e-waste challenge and the potential of the circular economy to facilitate sustainability in ICTs and add new values to supply chain management is studied by Question 7/5. This Question seeks to address the e-waste challenge by identifying the environmental requirements of digital technologies including IoT, end-user equipment and ICT infrastructures or installations, based on the circular economy principles and improving the supply chain management.

Q7/5 is currently working on seventeen work items. During the last SG5 meeting, experts agreed to start working on draft Recommendation ITU-T L.SCCA “Supply-chain based carbon accounting information guidelines for ICT manufacturing industries “, draft Recommendation ITU-T L.GPSIM “Good practices for the sanitization of the information media in end-of-life ICT devices”, draft Recommendation L.ICT\_PROCURE “Public procurement of ICTs to mitigate the adverse effects of e-waste”, draft Supplement L.Suppl.ICIP “Best practices for implementing the circular economy in ICT management”, and draft Supplement ITU-T L.Suppl.GSP to ITU-T L.1060 “Specific principles for the green supply chain management of information and communication technology manufacturing industry”. During the last SG5 meeting, experts also agreed to revise Recommendation ITU-T L.1031 in order to harmonize its methodology with the methodology on the E-waste inventory presented by BDT.

**3.7 Guides and terminology on environment**

The activities on the development of Guides and terminology on environment and climate change are studied by Question 8/5. Q8/5 is tasked to work on all terms, definitions, abbreviations, letter symbols and schematic symbols used in the ITU-T Study Group 5 Recommendations, Supplements, Handbooks and Directives; harmonize with terminology used by other parties outside of ITU-T Study Group 5; and liaise with other bodies regarding terminology used in the Study Group 5 Recommendations, among others.

Q8/5 is currently working on four work items including: Guide to the K & relevant L-series Recommendations “Extension of the Guide to cover relevant L-series Recommendations”; Mitigation Handbook - Additional case studies “Additional case studies to be added”; Terminology Handbook “Extension of the Terminology Handbook to cover relevant L-series terminologies” and Terminology Handbook - web version “Web version of the Terminology Handbook”.

Q8/5 works closely with ITU-T Standardization Committee for Vocabulary (SCV).

**3.8 Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement**

Question 9/5 aims to develop assessment methodologies and guidance that allow objective, transparent and practical assessments of the sustainability impacts of digital technologies, including information and communication technologies (ICTs), artificial intelligence, 5G, etc., in order to align their developmental trajectories with the Paris Agreement and the United Nations Sustainable Development Agenda. This Question also aims to study how environmental assessments may be used in the frame of broader sustainable development assessments including economic, environmental and social assessments.

Q9/5 is currently working on fifteen work items.

During the last ITU-T SG5 meeting, experts agreed to start working on draft Recommendation ITU‑T L.Database “Guidance for the creation of an ITU database on GHG emissions of the global ICT sector”, draft Recommendation ITU-T L.Biodiversity\_footprint “Methodology for the assessment of the footprint of an ICT organization on biodiversity”, draft Recommendation ITU-T L.Biodiversity\_opportunities “Development of guidance on how to assess the second order effects of ICT solutions on biodiversity, including positive effects”, draft Recommendation ITU-T L.GHGintensities “GHG emissions intensity indicators for telecom network operators”, draft Recommendation ITU-T L.GHGemissions\_BS “Methodologies for accounting Greenhouse Gas Emissions of Base Station sites”, draft Recommendation ITU-T L.GHGemissions\_DC “Methodologies for accounting Greenhouse Gas Emissions of Data Centers and Telecommunication rooms”, and draft Recommendation ITU-T L.GHGemissions\_IP “Methodologies for accounting Greenhouse Gas Emissions of Industrial Parks”.

Q9/5 agreed to adopt the FG-AI4EE Technical Report into draft Supplement ITU-T L.Suppl.DC&SDG “Assessing environmentally efficient data centre and cloud computing in the framework of the UN sustainable development goals”.

During the last ITU-T SG5 meeting, experts also agreed to revise two Recommendations: ITU-T L.1471 “Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies”, and ITU-T L.1420 “Methodology for energy consumption and greenhouse gas emissions impact assessment of information and communication technologies in organizations”.

**3.9 Climate change mitigation and smart energy solutions**

The use of ICTs and smart technologies to improve the efficiency of energy management systems and reduce carbon emissions is being studied by Question 11/5. Question 11/5 aims to develop standards, guidance, Supplements and/or Technical Reports to create a smart energy system using ICT and digital technologies such as artificial intelligence, apply smart energy solutions to achieve a low-carbon economy, and develop effective and efficient ICT and digital technologies-based solutions for energy management and energy saving solutions.

Q11/5 is currently working on twelve work items. During the last ITU-T SG5 meeting, experts agreed to start working on draft Recommendation ITU-T L.MM&BP\_IP “Measurement methodology and Best Practices for decarbonization of Industrial Park in support of Net Zero “, draft Recommendation ITU-T L.MM&BP\_BS “Measurement methodology and Best Practices for decarbonization of Base Station sites in support of Net Zero”, draft Recommendation ITU-T L.MM&BP\_DC “Measurement methodology and Best Practices for decarbonization of Data Center and Telecommunication Room in support of Net Zero”, and draft Recommendation ITU-T L.MM&BP\_SC “Best Practices for decarbonization of Smart City in support of Net Zero”.

Q11/5 also agreed to adopt the FG-AI4EE Technical Reports into draft Supplement ITU-T L.Suppl.dces “Data center energy saving: Application of AI technology in improving energy efficiency of telecom equipment rooms and internet data center infrastructure”.

**3.10 Adaptation to climate change through sustainable and resilient digital technologies**

The use of sustainable and resilient ICTs and digital technologies to adapt to the effects of climate change is being studied by Question 12/5. This Question looks to support the development of energy efficiency ICT architectures, add energy saving features to ICTs equipment and applications, improve air flow controlling technology, cooling technology and renewable energy systems and more. It also recognizes the lack of adequate broadband infrastructure in rural areas. Question 12/5 aims to develop Recommendations, Supplements and/or Technical Reports that support the deployment of digital technologies in accelerating climate adaptation actions. Particular emphasis has been placed on expanding the capacity of rural communities and areas to build and maintain climate resilient ICT infrastructures.

Q12/5 is currently working on two work items.

**3.11 Building circular and sustainable cities and communities**

The building of circular and sustainable cities and communities is being studied by Question 13/5**.** Question 13/5 aims to develop Recommendations, Supplements and/or Technical Reports identifying requirements and providing guidance, innovative frameworks and tools that support the transition to a circular city.

Q13/5 is currently working on seven work items. During the last ITU-T SG5 meeting, experts agreed to start working on draft Recommendation ITU-T L.FrameworkBIMSssc “Framework of Building Infrastructure Management System for Sustainable City”.

**4 Collaboration with other SGs and external organizations**

WP1/5 maintains collaboration with ITU-T SG15 on conformance and interoperability, IEC TC81 and CENELEC TC 81X on lightning protection, IEC TC 108 on safety (especially on remote power feeding), IEC SC 37A and 37B on surge protective devices, IEC SC 77B on high frequency transients, and ETSI ERM on lightning protection, CIGRÉ, CIRED and UIC on power frequency interference, IEC TC 64 on safety (protection against electric shock), and IEEE PES SPDC on surge protective devices.

It also maintains collaboration with ITU-T SG9 and ITU-R WP1A, WP1C, WP4A, WP4C, WP5A, WP5B, WP5C, WP5D and WP6A on EMC issues; with ITU-D, WHO, ICNRIP and IEC TC106 on topics on assessment of human exposure to electromagnetic fields (RF EMF); with ITU-T SG17 and IEC SC77C on topics on security of telecommunication and information systems concerning the electromagnetic environment. WP1/5 collaborates also with ITU-T SG12, IEC TC47 and IEC TC 107 for studies on soft error by particle radiations. Additionally, WP1/5 exchanges information with IEC SC77B, SC77C, TC106 and CISPR through liaisons with IEC ACEC. WP1/5 also maintains collaboration with CISPR/I.

WP2/5 maintains close collaboration with ETSI TC EE, ITU-T SG11; ITU-T SG2; FAO, and the World Bank on ICTs and adaptation to the effects of climate change topics; with IEC SEG4 on advance and low impact power feeding solutions and with 3GPP; ATIS; CCSA; CEDARE; ETNO; ETSI TC ATTM, FG AI4H; FG ML5G; FG NET2030; FG-VM; ISO; IEC; IEEE; CEN/CLC/JTC 10; IEC SyC LVDC; JCA-IMT2020; JCA-IoT and SC&C; ITU-T SG2; ITU-T SG3; ITU-T SG9; ITU-T SG11; ITU‑T SG12; ITU-T SG13; ITU-T SG15; ITU-T SG16; ITU-T SG17; ITU-T SG20, SCV, ISO TC323 “Circular Economy” on e-waste management, energy efficiency, circular economy and other green ICT standard topics. WP2/5 has also collaborated with ISO/TMBG/CCCC "Climate Change Coordination Committee (CCCC)". Additionally, WP2/5 exchanges information with ISO TC 207, CEN/CLC environmental TC, IEC SyC Smart Cities through liaisons with IEC ACEA.

Additionally, WP2/5 collaborates closely with GSMA, GESI, SBTi and IEA on the topics related to GHG emissions trajectories for the ICT sector. ITU-T SG5 collaborates and cooperates with the Basel Convention and UNIDO on e-waste management. Additionally, SG5 is working together with UNIDO in a project in Latin America in the implementation of the Recommendations on e-waste management.

ITU-T SG5 led the subgroup on Supply Chain Transparency and Circularity of the Policy Network of Environment (PNE) of the Internet Governance Forum. The chapter highlighted the role of digitalization in improving sustainability of the ICT supply chain and the importance of tackling the environmental impacts of ICT through circularity in order to achieve a sustainable digital transformation. The chapter focused on developing four policy recommendations that aimed to support relevant stakeholders to improve the sustainability of ICTs and digitalization. Among these policy recommendations include the use of international standards (with examples of ITU standards) to achieve circularity in the ICT supply chain. The chapter was presented at the IGF PNE session on 9 December 2021.

**5 ITU-T Study Group 5 Regional Groups**

ITU-T Study Group 5 has the following Regional Groups:

* [SG5 Regional Group for the Africa Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rgafr/Pages/default.aspx) (SG5RG-AFR) held its first meeting in Zanzibar, Tanzania on 9 April 2018. The second meeting was held on 29-30 August 2019 in Abuja, Nigeria, during the [1st Digital African Week](https://www.itu.int/en/ITU-T/climatechange/Pages/1st-Digital-African-Week.aspx). The third meeting was held virtually on 28 September 2021 during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx).
* [SG5 Regional Group for the Arab Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rgarb/Pages/default.aspx) (SG5RG-ARB) held its first meeting in Zanzibar, Tanzania on 10 April 2018. The second meeting was held on 18 December 2018 in Kuwait city, Kuwait. The third meeting was held virtually on 29 September 2021 during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx).
* [SG5 Regional Group for Latin America](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rglatam/Pages/default.aspx) (SG5RG-LATAM) held its first meeting in Cartagena de Indias, Colombia on 19 April 2018. The second meeting was held on 24 October 2018 in Bogotá, Colombia. The third meeting was held virtually on 10 November 2020. The fourth meeting was held virtually on 30 September 2021 during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx).
* [SG5 Regional Group for Asia and the Pacific](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rgap/Pages/default.aspx) (SG5RG-AP) held its first virtual meeting on 29 and 30 September 2020. The second meeting was held virtually on 15-16 April 2021. The third meeting was held on 19 and 20 October 2021. The meeting was collocated with the [Dialogue on Sustainable Digital Transformation in Asia and the Pacific](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/20211019/Pages/default.aspx) on 19 October 2021.

**6 Focus Group on "Environmental Efficiency for Artificial Intelligence and other Emerging Technologies" (FG-AI4EE)**

The fourth meeting of the FG-AI4EE took place on 21 October 2021 and was preceded by a [Webinar on AI for environmental sustainability](https://aiforgood.itu.int/event/ai-for-environmental-sustainability/) on 20 October 2021.

During the meeting the FG-AI4EE approved five deliverables including Technical Report on “Best Practices for Graphical Digital Twins of Smart Cities (D.WG1-11), Technical Report on “Computer Processing, Data management and Energy perspective” (D.WG2-02), Technical Report on “Assessment of Environmentally Efficient Data Centre and Cloud Computing in the framework of the UN Sustainable Development Goals (SDGs)” (D.WG2-06), Technical Report on “Guidelines on the implementation of eco-friendly criterias for AI and other emerging technologies” (D.WG3-01), and Technical Report on “Application of AI technology in improving energy efficiency of telecom equipment rooms and Internet Data Center infrastructure” (D.WG3-03).

The FG-AI4EE requested ITU-T SG5 for a one-year extension, to last until December 2022. This request was approved by ITU-T SG5.

The FG-AI4EE deliverables submitted to ITU-T SG5 were addressed as shown in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliverable #** | **Type** | **Title** | **Action taken by ITU-T SG5** |
| D.WG2-02 | TR | Computer Processing, Data management and Energy perspective | It was adopted as a draft Supplement as contained in the A.13 justification ([TD2171](https://www.itu.int/md/meetingdoc.asp?lang=en&parehttps://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-211130-TD-GEN-2171nt=T17-SG05-211130-TD-GEN-2171)) |
| D.WG2-06 | TR | Assessment of Environmentally Efficient Data Centre and Cloud Computing in the framework of the UN Sustainable Development Goals (SDGs) | It was adopted as a draft Supplement as contained in the A.13 justification ([TD2115](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-211130-TD-GEN-2115)). |
| D.WG3-01 | TR | Guidelines on the implementation of eco-friendly criteria for AI and other emerging technologies | It was adopted as a draft Supplement as contained in the A.13 justification ([TD2172](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-211130-TD-GEN-2172)) |
| D.WG3-03 | TR | Application of AI technology in improving energy efficiency of telecom equipment rooms and Internet Data Centre infrastructure | It was adopted as a draft Supplement as contained in the A.13 justification ([TD2176](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-211130-TD-GEN-2176)) |

The FG-AI4EE has the following structure:

* **Working Group 1** - Requirements of AI and other Emerging Technologies to Ensure Environmental Efficiency. [List of WG1 deliverables.](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/WG1deliverables.aspx)
* **Working Group 2** - Assessment and Measurement of the Environmental Efficiency of AI and Emerging Technologies. [List of WG2 deliverables.](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/WG2deliverables.aspx)
* **Working Group 3** – Implementation Guidelines of AI and Emerging Technologies for Environmental Efficiency. [List of WG3 deliverables.](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/WG3deliverables.aspx)

The previous FG-AI4EE meetings are the following:

* Third FG-AI4EE meeting, virtual, 8 April 2021. [Meeting report.](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Documents/Report%20of%20ITU%20FG-AI4EE%203rd%20meeting%2c%2008%20April%202021.docx)
  + [Webinar on AI for sustainable transformation in smart cities, mobility & energy](https://aiforgood.itu.int/event/ai-for-sustainable-transformation-in-smart-cities-mobility-energy/) , virtual, 7 April 2021
* Second FG-AI4EE meeting, virtual, 10 December 2020. [Meeting report](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Documents/AI4EE-O-002_Report%20of%20ITU%20FG-AI4EE%202nd%20meeting%2c%2010%20December%202021.docx).
  + [Virtual Workshop on AI & environmental efficiency](https://www.itu.int/en/ITU-T/climatechange/Pages/20201209.aspx), virtual, 9 December 2020.
* Frist FG-AI4EE meeting, Vienna, Austria, 12 December 2019. [Meeting report](https://extranet.itu.int/sites/itu-t/focusgroups/ai4ee/_layouts/15/WopiFrame2.aspx?sourcedoc=%7b111E60E9-0339-4D29-BC3D-157FA2F70ED1%7d&file=AI4EE-O-001.docx&action=default).

The FG-AI4EE website is available [here](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/default.aspx).

**7 Other activities**

**7.1 Events on Environment, Climate Change and Circular Economy**

The following event was organized:

* [10th Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/202112/Pages/default.aspx), virtual, 14-16 December 2021. The 10th GSW had the following structure:
* **Day 1:**[**14 December 2021:** High-level dialogue on sustainable e-waste management and the circular economy in Latin America](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/202112/Pages/day-01.aspx)
* **Day 2:**[**15 December 2021:** Sustainable e-waste management in Costa Rica​](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/202112/Pages/day-02.aspx)
* **Day 3:**[**16 December 2021:** Beyond COP26 – Accelerating Net-Zero Through a Sustainable Digital Transformation](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/202112/Pages/day-03.aspx)

The [Case Study on Implementation of ITU-T standards on sustainable management of waste electrical and electronic equipment: The path to a Circular Economy in Costa Rica](https://www.itu.int/en/publications/Documents/tsb/2021-Economia-Circular-Costa-Rica/index.html#p=1) was published. This case study provides information on Costa Rica’s experience in the implementation of Recommendations ITU-T L.1031 "Guideline for achieving the e-waste targets of the Connect 2030 Agenda" and ITU-T L.1032 "Guidelines and certification schemes for e-waste recyclers".

The case study was launched during the 10th Green Standards Week on 15 December 2021.

**Annex 1**

**Achievements of ITU-T Study Group 5 on electromagnetic compatibility, lightning protection and electromagnetic effects; ICTs related to the environment, climate change, energy efficiency and clean energy and circular economy, including e‑waste  
(status from 16 October to 16 December 2021)**

* 1. **WP1/5 - EMC, lightning protection, EMF**

**1.1.1 Recommendations approved**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| None |  |  |

**1.1.2 Informative texts agreed**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 5 | K.Suppl.13 to Recommendation ITU-T K. | Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use |
| 5 | K.Suppl.20 to Recommendation ITU-T K. | Supplement on radiofrequency exposure evaluation around underground base stations |
| 5 | Appendix I to Recommendation ITU-T K.70 | Software "EMF-estimator" v8.0.32 and v8.64 |

**1.1.3 Deleted Recommendations**

|  |  |  |
| --- | --- | --- |
| SG | No. | Title |
| None |  |  |

**1.1.4 Discontinued Supplement**

|  |  |  |
| --- | --- | --- |
| SG | No. | Title |
| None |  |  |

**1.1.5 Recommendation consented (in AAP Last Call)**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 5 | K.147 | Protection of networked information technology equipment |
| 5 | K.124 | Overview of particle radiation effects on telecommunication systems |
| 5 | K.130 | Neutron irradiation test methods for telecommunication equipment |
| 5 | K.131 | Design methodologies for telecommunication systems applying soft error measure |
| 5 | K.138 | Quality estimation methods and application guidelines for mitigation measures based on particle radiation tests |
| 5 | K.139 | Reliability requirements for telecommunication systems affected by particle radiation |
| 5 | K.83 | Monitoring of the electromagnetic field levels |
| 5 | K.91 | Guidance for assessment, evaluation and monitoring of the human exposure to radio frequency electromagnetic fields |
| 5 | K.137 | Electromagnetic compatibility requirements and measurement methods for wireline telecommunication network equipment |
| 5 | K.151 | Electrical safety and lightning protection of medium voltage input and up to ±400VDC output power system in ICT data centre and telecommunication centre |

**1.2 WP2/5 - Environment, Energy Efficiency and the Circular Economy**

**1.2.1 Recommendations approved**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| None |  |  |

**1.2.2 Informative texts agreed**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 5 | LSuppl.45 | Radio base station site best practices |
| 5 | L.Suppl.46 | Definitions and Recent Trends in Circular Cities |

**1.2.3 Deleted Recommendations**

|  |  |  |
| --- | --- | --- |
| Q | No. | Title |
| None |  |  |

**1.2.4 Recommendations consented (in AAP Last Call)**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 5 | L.1331 | Assessment of mobile network energy efficiency |
| 5 | L.1035 | Sustainable Management of Batteries |
| 5 | L.1016 | Method for Evaluation of the Environmental, Health and Safety Performance of True Wireless Stereo Headphones |
| 5 | L.1036 | Scheduled waste management for base station (inclusive of e-waste) |
| 5 | L.1050 | Methodology to identify the key equipment in order to assess the environmental impact and e-waste generation of different network architectures |

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