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| ITU‑T Study Group 5 |
| Environment and climate change |
| Report of ITU-T SG5 to the World Telecommunication Standardization Assembly (WTSA-20), Part I: GENERAL |

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| **Abstract:** | This contribution contains the report of ITU-T Study Group 5 to WTSA-20 concerning its activities during the 2017-2021 study period. |
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Note by the TSB:

The report of Study Group 5 to WTSA-20 is presented in the following documents:

Part I: **Document** **1** – General; including proposed changes to WTSA Resolution 2 in Annex 2

Part II: **Document 2** – Questions proposed for study during the study period 2022-2024

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1 Introduction

1.1 Responsibilities of Study Group 5

Study Group 5 was entrusted by the World Telecommunications Standardization Assembly (Hammamet, 2016) with the study of 10 Questions in the area of ICTs and the environmental aspects of electromagnetic phenomena and climate change. Study Group 5 also studies issues related to resistibility, human exposure to electromagnetic fields, circular economy, energy efficiency and climate-change adaptation and mitigation. As such, Study Group 5 is responsible for studies relating to: the protection of telecommunication networks and equipment from interference and lightning; electromagnetic compatibility (EMC), particle radiation effects, and assessment of human exposure to electromagnetic fields (EMF) produced by ICT installations and devices, including cellular phones and base stations; the existing copper network outside plant and related indoor installations; achieving energy efficiency and sustainable clean energy in ICTs; methodologies for assessing the environmental impact of ICT, publishing guidelines for using ICTs in an eco-friendly way, dealing with e-waste issues (also including the environmental impact of counterfeit devices), enhancing rare-metal recycling and energy efficiency of ICT, including infrastructures.

As its first meeting (Geneva, 15-24 May 2017) of the Study Period (2017-2020), ITU-T SG5 experts agreed to delete Question 10/5 " Adaptation to climate change and low cost and sustainable resilient information and communication technologies (ICTs)", in accordance with the provisions of Resolution 1, Section 7, § 7.4.1, of WTSA (Hammamet, 2016), by reaching consensus among those present. Consequently, the new ITU-T Study Group 5 structure approved implies the incorporation/merging of Q10/5 (Adaptation to climate change and low cost and sustainable resilient information and communication technologies (ICTs)) into Q6/5 “Achieving energy efficiency and smart energy”, Q7/5 “Circular economy including e-waste” and Q9/5 “Climate change and assessment of information and communication technology (ICT) in the framework of the Sustainable Development Goals (SDGs)”.

The Telecommunication Standardization Advisory Group (TSAG) meeting held from 11 to 18 January 2021 endorsed a new set of Questions for SG5 ([TSAG-Report 14](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-TSAG-R-0014)). This set of Questions became effective on 18 January 2021, for the remainder of the study period.

1.2 Management team and meetings held by Study Group 5

Study Group 5 held 9 Plenary Session and two Working Parties meetings in the study period (see Table 1) under the Chairmanship Ms Maria Victoria Sukenik (Argentina) who served until September 2019, followed by the Acting-Chairmanship of Ms Nevine Tewfik (Egypt) for the 11-20 May 2020 meeting and Ms Qi Shuguang for the 19-23 October 2020, 11-20 May 2021 and 30 November – 10 December 2021 meeting assisted by Vice-Chairmen Mr Jean-Manuel CANET (France)**,** Mr Samyoung Chung (Rep. of Korea), Mr Vincent Urbain Namrona (Central African Republic), Mr Josef OPITZ (Germany), Mr Eiman Farouk Mahmoud OSMAN (Rep. of the Sudan), Ms Shuguang QI (China), Mr Leonid Rabinovich (United States of America), Mr Kazuhiro Takaya (Japan), Ms Nevine Tewfik (Egypt), Mr Fryderyk Lewicki (Poland), Chairman of Working Party 1/5, Mr Beniamino Gorini (Italy), Mr Michael Maytum (United Kingdom) and Ms Xia Zhang (China), Vice-Chairmen of WP1/5, Mr Paolo Gemma (Italy), Chairman of Working Party 2/5, Ms Nevine Tewfik (Egypt) Vice-Chairman of Working Party 2/5.

In addition, several rapporteur meetings (including e-meetings) were held during the study period in different locations, see Table 1-bis.

**TABLE 1
Meetings of Study Group 5 and its Working Parties**

|  |  |  |
| --- | --- | --- |
| **Meetings** | **Place, date** | **Reports** |
| Study Group 5 | Virtual meeting, 30 November – 10 December 2021 | [SG5-R11](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-R-0011) |
| Study Group 5 | Virtual meeting, 11-20 May 2021 | [SG5-R10](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-R-0010) |
| Study Group 5 | Virtual meeting, 19-23 October 2020 | [SG5-R9](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05-R-0009) |
| Study Group 5 | Virtual meeting, 11-20 May 2020 | [SG5-R8](https://www.itu.int/md/T17-SG05-R-0008/en) |
| Study Group 5 | Geneva, 16-20 September 2019 | [SG5-R7](https://www.itu.int/md/T17-SG05-R-0007) |
| Study Group 5 | Geneva, 13-22 May 2019 | [SG5-R6](https://www.itu.int/md/T17-SG05-R-0006) |
| Study Group 5 | Geneva, 11-21 September 2018 | [SG5-R5](https://www.itu.int/md/T17-SG05-R-0005) |
| WP1/5 | Geneva, 21-25 May 2018 | [SG5-R4](https://www.itu.int/md/T17-SG05-R-0004) |
| WP2/5 | Geneva, 5-9 March 2018 | [SG5-R3](https://www.itu.int/md/T17-SG05-R-0003) |
| Study Group 5 | Sophia Antipolis, 13-22 November 2017 | [SG5-R2](https://www.itu.int/md/T17-SG05-R-0002) |
| Study Group 5 | Geneva, 15-24 May 2017 | [SG5-R1](https://www.itu.int/md/T17-SG05-R-0001) |

**TABLE 1-bis
Rapporteur meetings organized under Study Group 5 during the study period**

| ***Dates*** | ***Place/Host*** | ***Question(s)*** | ***Event name*** |
| --- | --- | --- | --- |
| 2016-11-09 | E-Meeting | [Q19/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5719&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0019)] | Q19/5 discussions |
| 2016-11-24 | E-Meeting | [Q15/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5726&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0089)] | Q15/5 discussions |
| 2016-12-15 | E-Meeting | [Q15/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5727&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0103)] | Q15/5 discussions |
| 2017-01-11 | E-Meeting | [Q19/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5721&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0020)] | Q19/5 discussions |
| 2017-01-11 | E-Meeting | [Q17/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=6777&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0072)] | Q17/5 discussions |
| 2017-01-19 | E-Meeting | [Q15/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5728&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0100)] | Q15/5 discussions |
| 2017-02-08 to 2017-02-10 | France [Paris] | [Q18/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=6768&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0044)] | Q18/5 discussions |
| 2017-02-14 | E-Meeting | [Q17/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5734&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0073)] | Q17/5 discussions |
| 2017-02-16 | E-Meeting | [Q19/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5722&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0077)] | Q19/5 discussions |
| 2017-02-16 | E-Meeting | [Q15/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5729&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0099)] | Q15/5 discussions |
| 2017-03-08 | E-Meeting | [Q19/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5723&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0078)] | Q19/5 discussions |
| 2017-04-03 | E-Meeting | [Q10/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=6877&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0087)] | Q8/5 discussion (ex - Q15/5) |
| 2017-04-12 | E-Meeting | [Q19/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=5724&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0079)] | Q19/5 discussions |
| 2017-05-04 | E-Meeting | [Q10/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=6911&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0086)] | Q8/5 (ex Q15/5) discussions |
| 2017-05-05 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=6899&Group=5) [[Report](http://www.itu.int/md/T17-SG05-170515-TD-GEN-0106)] | Q6/5 discussion (ex Q17/5) |
| 2017-05-30 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8921&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0248)] | Joint EE2-Q6/5 e-meeting |
| 2017-06-14 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8935&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0241)] | Q7/5 Rapporteur e-meeting |
| 2017-06-21 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8941&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0307)] | Q9/5 Rapporteur e-meeting |
| 2017-06-22 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8937&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0308)] | Q9/5 Rapporteur e-meeting |
| 2017-06-26 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8944&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0242)] | Q7/5 Rapporteur e-meeting |
| 2017-06-27 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8977&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0244)] | Q6/5 Rapporteur e-meeting joint with EE2 |
| 2017-07-04 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8924&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0245)] | Q6/5 Rapporteur e-meeting |
| 2017-07-13 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8939&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0309)] | Q9/5 Rapporteur e-meeting |
| 2017-07-13 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8947&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0243)] | Q7/5 Rapporteur e-meeting |
| 2017-07-21 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8942&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0310)] | Q9/5 Rapporteur e-meeting |
| 2017-08-16 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8928&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0267)] | Q6/5 Rapporteur e-meeting |
| 2017-08-24 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9028&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0311)] | Q9/5 Rapporteur e-meeting |
| 2017-09-05 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8929&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0265)] | Q6/5 Rapporteur e-meeting |
| 2017-09-06 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8930&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0266)] | Q6/5 Rapporteur e-meeting |
| 2017-09-06 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8949&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0298)] | Q7/5 Rapporteur e-meeting |
| 2017-10-06 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8943&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0312)] | Q9/5 Rapporteur e-meeting |
| 2017-10-10 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8950&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0297)] | Q7/5 Rapporteur e-meeting |
| 2017-10-12 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8940&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0313)] | Q9/5 Rapporteur e-meeting |
| 2017-10-30 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9037&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0304)] | Q7/5 Rapporteur e-meeting |
| 2017-11-08 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=8934&Group=5) [[Report](http://www.itu.int/md/T17-SG05-171113-TD-GEN-0327)] | Q6/5 Rapporteur e-meeting |
| 2017-12-07 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9148&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0440)] | Q7/5 Rapporteur e-meeting |
| 2017-12-12 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9145&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0451)] | Q6/5 Rapporteur e-meeting |
| 2017-12-14 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9149&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0441)] | Q7/5 Rapporteur e-meeting |
| 2017-12-14 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9153&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0427)] | Q9/5 Rapporteur e-meeting |
| 2017-12-20 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9150&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0432)] | Q7/5 Rapporteur e-meeting |
| 2018-01-11 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9154&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0436)] | Q9/5 Rapporteur e-meeting |
| 2018-01-16 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9146&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0433)] | Q6/5 Rapporteur e-meeting |
| 2018-01-17 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9170&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0442)] | Q7/5 Rapporteur e-meeting |
| 2018-01-18 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9151&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0431)] | Q7/5 Rapporteur e-meeting |
| 2018-02-06 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9155&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0435)] | Q9/5 Rapporteur e-meeting |
| 2018-02-07 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9158&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0434)] | Q9/5 Rapporteur e-meeting |
| 2018-02-12 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9161&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0430)] | Q7/5 Rapporteur e-meeting |
| 2018-02-22 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9152&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0443)] | Q7/5 Rapporteur e-meeting |
| 2018-02-27 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9147&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180305-TD-GEN-0452)] | Q6/5 Rapporteur e-meeting |
| 2018-04-16 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9237&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0662)] | Q7/5 Rapporteur e-meeting |
| 2018-04-16 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9251&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0627)] | Q9/5 Rapporteur e-meeting |
| 2018-04-18 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9248&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0668)] | Q7/5 Rapporteur e-meeting |
| 2018-04-23 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9240&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0663)] | Q7/5 Rapporteur e-meeting |
| 2018-05-08 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9244&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0669)] | Q7/5 Rapporteur e-meeting |
| 2018-05-28 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9238&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0664)] | Q7/5 Rapporteur e-meeting |
| 2018-05-29 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9233&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0649)] | Q6/5 Rapporteur e-meeting together with ETSI EE discussions |
| 2018-05-30 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9301&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0625)] | Q6/5 Rapporteur e-meeting together with ETSI EE discussions |
| 2018-06-04 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9253&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0628)] | Q9/5 Rapporteur e-meeting |
| 2018-06-05 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9245&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0670)] | Q7/5 Rapporteur e-meeting |
| 2018-06-12 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9234&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0626)] | Q6/5 Rapporteur e-meeting |
| 2018-06-13 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9249&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0671)] | Q7/5 Rapporteur e-meeting |
| 2018-06-25 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9329&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0629)] | Q9/5 Rapporteur e-meeting |
| 2018-07-03 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9239&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0672)] | Q7/5 Rapporteur e-meeting |
| 2018-07-05 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9332&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0641)] | Q9/5 Rapporteur e-meeting |
| 2018-07-10 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9235&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0643)] | Q6/5 Rapporteur e-meeting |
| 2018-07-12 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9250&Group=5) [[Report](http://www.itu.int/md/T17-SG05-180911-TD-GEN-0673)] | Q7/5 Rapporteur e-meeting |
| 2018-10-18 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9428&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0880)] | Q7/5 Rapporteur e-meeting |
| 2018-10-19 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9424&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0846)] | Q9/5 Rapporteur e-meeting |
| 2018-11-20 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9431&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0845)] | Q6/5 Rapporteur e-meeting |
| 2018-11-22 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9479&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0882)] | Q7/5 Rapporteur e-meeting |
| 2018-11-22 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9446&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0847)] | Q9/5 Rapporteur e-meeting |
| 2018-12-05 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9437&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0879)] | Q7/5 Rapporteur e-meeting |
| 2018-12-10 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9438&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0878)] | Q7/5 Rapporteur e-meeting |
| 2018-12-11 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9502&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0898)] | Q7/5 Rapporteur e-meeting |
| 2019-01-10 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9439&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0897)] | Q7/5 Rapporteur e-meeting |
| 2019-01-17 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9440&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0899)] | Q7/5 Rapporteur e-meeting |
| 2019-01-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9448&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0866)] | Q9/5 Rapporteur e-meeting |
| 2019-01-29 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9537&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0864)] | Q6/5 Rapporteur e-meeting |
| 2019-01-29 to 2019-01-30 | France [Paris] | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9451&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0863)] | Q9/5 Rapporteur meeting |
| 2019-02-11 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9566&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0862)] | Q9/5 Rapporteur e-meeting |
| 2019-02-14 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9441&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0870)] | Q7/5 Rapporteur e-meeting |
| 2019-02-18 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9569&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0867)] | Q9/5 Rapporteur e-meeting |
| 2019-02-18 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9545&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0868)] | Q7/5 Rapporteur e-meeting |
| 2019-03-07 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9442&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0877)] | Q7/5 Rapporteur e-meeting |
| 2019-03-12 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9575&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0876)] | Q9/5 Rapporteur e-meeting |
| 2019-03-19 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9433&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0894)] | Q6/5 Rapporteur e-meeting |
| 2019-03-20 to 2019-03-21 | France [Paris] | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9576&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0881)] | Q9/5 Rapporteur meeting |
| 2019-03-27 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9578&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0905)] | Q7/5 Rapporteur e-meeting |
| 2019-04-04 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9450&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0888)] | Q9/5 Rapporteur e-meeting |
| 2019-04-11 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9444&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0906)] | Q7/5 Rapporteur e-meeting |
| 2019-04-23 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9434&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0907)] | Q6/5 Rapporteur e-meeting |
| 2019-04-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9617&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190513-TD-GEN-0901)] | Q9/5 Rapporteur e-meeting |
| 2019-06-05 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9671&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1030)] | Q9/5 Rapporteur e-meeting |
| 2019-06-14 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9664&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1112)] | Q7/5 Rapporteur e-meeting |
| 2019-06-20 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9679&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1031)] | Q9/5 Rapporteur e-meeting |
| 2019-06-25 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9661&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1036)] | Q6/5 Rapporteur e-meeting |
| 2019-06-27 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9665&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1037)] | Q7/5 Rapporteur e-meeting |
| 2019-07-02 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9672&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1032)] | Q9/5 Rapporteur e-meeting |
| 2019-07-16 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9673&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1033)] | Q9/5 Rapporteur e-meeting |
| 2019-07-17 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9724&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1034)] | Q9/5 Rapporteur e-meeting |
| 2019-07-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9727&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1035)] | Q9/5 Rapporteur e-meeting |
| 2019-07-30 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9753&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1049)] | Q9/5 Rapporteur e-meeting |
| 2019-08-15 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9756&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1161)] | Q9/5 Rapporteur e-meeting |
| 2019-08-27 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9663&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1129)] | Q6/5 Rapporteur e-meeting |
| 2019-08-28 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9674&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1101)] | Q9/5 Rapporteur e-meeting |
| 2019-08-29 to 2019-08-30 | France [Paris] | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9676&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1108)] | Q9/5 Rapporteur meeting |
| 2019-09-04 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9675&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1102)] | Q9/5 Rapporteur e-meeting |
| 2019-09-05 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9670&Group=5) [[Report](http://www.itu.int/md/T17-SG05-190916-TD-GEN-1104)] | Q7/5 Rapporteur e-meeting |
| 2019-10-21 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9787&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1326)] | Q7/5 Rapporteur e-meeting |
| 2019-10-31 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9788&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1327)] | Q7/5 Rapporteur e-meeting |
| 2019-11-20 to 2019-11-21 | United Kingdom [London] | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9796&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1271)] | Q9/5 Rapporteur meeting |
| 2019-11-28 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9792&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1276)] | Q7/5 Rapporteur e-meeting |
| 2019-11-29 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9784&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1278)] | Q6/5 Rapporteur e-meeting |
| 2019-12-11 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9904&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1204)] | Q9/5 Rapporteur e-meeting |
| 2019-12-12 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9794&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1277)] | Q7/5 Rapporteur e-meeting |
| 2020-01-07 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9932&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1272)] | Q9/5 Rapporteur e-meeting |
| 2020-01-16 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9931&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1281)] | Q7/5 Rapporteur e-meeting |
| 2020-01-21 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9945&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200310-TD-GEN-1273)] | Q9/5 Rapporteur e-meeting |
| 2020-02-05 to 2020-02-06 | France [Paris] | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9933&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1285)] | Q9/5 Rapporteur meeting |
| 2020-02-13 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9946&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1284)] | Q7/5 Rapporteur e-meeting |
| 2020-02-14 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9950&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1283)] | Q6/5 Rapporteur e-meeting |
| 2020-02-19 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9953&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1312)] | Q9/5 Rapporteur e-meeting |
| 2020-02-25 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9986&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1292)] | Q7/5 Rapporteur e-meeting |
| 2020-03-12 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9997&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1302)] | Q9/5 Rapporteur e-meeting |
| 2020-03-20 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10031&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1293)] | Q7/5 Rapporteur e-meeting |
| 2020-03-26 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10030&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1309)] | Q7/5 Rapporteur e-meeting |
| 2020-03-27 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9996&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1308)] | Q6/5 Rapporteur e-meeting |
| 2020-04-06 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9999&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1301)] | Q9/5 Rapporteur e-meeting |
| 2020-04-07 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10074&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1307)] | Q7/5 Rapporteur e-meeting |
| 2020-04-21 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10107&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1311)] | Q7/5 Rapporteur e-meeting |
| 2020-04-21 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10115&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1330)] | Q6/5 Rapporteur e-meeting |
| 2020-04-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=9998&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1328)] | Q9/5 Rapporteur e-meeting |
| 2020-04-28 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10108&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1317)] | Q7/5 Rapporteur e-meeting |
| 2020-04-30 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10121&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1329)] | Q6/5 Rapporteur e-meeting |
| 2020-05-05 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10000&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1313)] | Q9/5 Rapporteur e-meeting |
| 2020-05-05 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10110&Group=5) [[Report](http://www.itu.int/md/T17-SG05-200511-TD-GEN-1335)] | Q7/5 Rapporteur e-meeting |
| 2020-05-26 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10283&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1468)] | Q9/5 Rapporteur e-meeting |
| 2020-05-26 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10291&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1517)] | Q7/5 Rapporteur e-meeting joint with ETSI EEPS |
| 2020-06-10 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10299&Group=5) [[Report](http://www.itu.int/md/T17-SG05-201019-TD-GEN-1458)] | Q9/5 Rapporteur e-meeting |
| 2020-06-17 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10303&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1542)] | Q7/5 Rapporteur e-meeting |
| 2020-06-25 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11460&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1572)] | Q7/5 Rapporteur e-meeting |
| 2020-06-26 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10300&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1469)] | Q9/5 Rapporteur e-meeting |
| 2020-06-30 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11470&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1516)] | Q7/5 Rapporteur e-meeting |
| 2020-07-16 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10335&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1547)] | Q7/5 Rapporteur e-meeting |
| 2020-08-18 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11506&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1546)] | Q6/5 Rapporteur e-meeting |
| 2020-08-20 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11478&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1470)] | Q9/5 Rapporteur e-meeting |
| 2020-08-21 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11555&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1538)] | Q6/5 Rapporteur e-meeting |
| 2020-08-21 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10336&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1548)] | Q7/5 Rapporteur e-meeting |
| 2020-08-27 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11554&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1464)] | Q7/5 Rapporteur e-meeting |
| 2020-09-04 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11560&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1474)] | Q9/5 Rapporteur e-meeting |
| 2020-09-08 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=10332&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1539)] | Q6/5 Rapporteur e-meeting |
| 2020-09-09 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11563&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1471)] | Q7/5 Rapporteur e-meeting |
| 2020-09-10 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11565&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1515)] | Q7/5 Rapporteur e-meeting joint with ETSI EEPS |
| 2020-09-16 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11564&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1514)] | Q7/5 Rapporteur e-meeting |
| 2020-09-22 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11562&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1545)] | Q7/5 Rapporteur e-meeting |
| 2020-09-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11580&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1564)] | Q9/5 Rapporteur e-meeting |
| 2020-09-25 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11579&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1530)] | Q7/5 Rapporteur e-meeting joint with ETSI EEPS |
| 2020-09-29 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11599&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1544)] | SG5: Q7 Rapporteur e-meeting |
| 2020-10-05 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11597&Group=5) [[Report](https://www.itu.int/md/T17-SG05-201019-TD-GEN-1565)] | SG5: Q9 Rapporteur e-meeting |
| 2020-10-27 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11723&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1651)] | Joint session ETSI EEPS and Q7/5 |
| 2020-11-20 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11765&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1653)] | Joint meeting ETSI EEPS and Q7/5 |
| 2020-11-24 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11788&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1770)] | Joint meeting ETSI EEPS and Q6/5 |
| 2020-11-27 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11741&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1659)] | Q9/5 Rapporteur e-meeting |
| 2020-11-30 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11773&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1773)] | Q7/5 Rapporteur e-meeting |
| 2020-12-09 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11772&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1774)] | Q7/5 Rapporteur e-meeting |
| 2020-12-14 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11742&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1660)] | Q9/5 Rapporteur e-meeting |
| 2021-01-12 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11838&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1775)] | Q7/5 Rapporteur e-meeting |
| 2021-01-13 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11770&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1776)] | Q7/5 Rapporteur e-meeting |
| 2021-01-15 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11743&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1670)] | Q9/5 Rapporteur e-meeting |
| 2021-01-19 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11779&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1771)] | Q6/5 Rapporteur e-meeting |
| 2021-02-12 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11744&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1679)] | Q9/5 Rapporteur e-meeting |
| 2021-02-17 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11775&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1777)] | Q7/5 Rapporteur e-meeting |
| 2021-03-12 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11745&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1765)] | Q9/5 Rapporteur e-meeting |
| 2021-03-23 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12381&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1778)] | Q7/5 Rapporteur e-meeting |
| 2021-03-30 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=11781&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1772)] | Q6/5 Rapporteur e-meeting |
| 2021-03-30 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12389&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1683)] | Q7/5 Rapporteur e-meeting |
| 2021-04-07 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12359&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1783)] | Q9/5 Rapporteur e-meeting |
| 2021-04-13 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12449&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1751)] | Q7/5 Rapporteur e-meeting |
| 2021-04-15 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12450&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1779)] | Q7/5 Rapporteur e-meeting |
| 2021-04-21 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12447&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1784)] | Q7/5 Rapporteur e-meeting |
| 2021-04-23 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12360&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1789)] | Q9/5 Rapporteur e-meeting |
| 2021-05-05 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12458&Group=5) [[Report](https://www.itu.int/md/T17-SG05-210511-TD-GEN-1785)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-06-03 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12598&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2013)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-06-10 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12618&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2011)] | Joint session ETSI EEPS and Q6/5 |
| 2021-06-11 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12588&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2005)] | Q9/5 Rapporteur e-meeting |
| 2021-06-15 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12591&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2045)] | Q7/5 Rapporteur e-meeting |
| 2021-06-30 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12606&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2004)] | Q9/5 Rapporteur e-meeting |
| 2021-07-01 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12599&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2012)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-07-02 | E-Meeting | [Q12/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12623&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2048)] | Q12/5 Rapporteur e-meeting |
| 2021-07-08 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12655&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2024)] | Q7/5 Rapporteur e-meeting |
| 2021-07-15 | E-Meeting | [Q13/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12628&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2009)] | Q13/5 Rapporteur e-meeting |
| 2021-07-15 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12661&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2047)] | Q7/5 Rapporteur e-meeting |
| 2021-07-29 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12600&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2203)] | Q7/5 Rapporteur e-meeting |
| 2021-08-02 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12595&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2037)] | Q6/5 Rapporteur e-meeting |
| 2021-08-16 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12709&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2026)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-08-19 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12601&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2028)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-08-23 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12711&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2029)] | Q7/5 Rapporteur e-meeting. |
| 2021-08-24 | E-Meeting | [Q11/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12708&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2010)] | Q11/5 Rapporteur e-meeting |
| 2021-08-25 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12607&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2006)] | Q9/5 Rapporteur e-meeting |
| 2021-08-27 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12715&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2030)] | Q7/5 Rapporteur e-meeting |
| 2021-09-03 | E-Meeting | [Q12/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12625&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2049)] | Q12/5 Rapporteur e-meeting |
| 2021-09-06 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12596&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2038)] | Q6/5 Rapporteur e-meeting |
| 2021-09-10 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12716&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2063)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-09-14 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12726&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2127)] | Q7/5 Rapporteur e-meeting |
| 2021-09-15 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12718&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2031)] | Q7/5 Rapporteur e-meeting |
| 2021-09-16 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12608&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2007)] | Q9/5 Rapporteur e-meeting |
| 2021-09-23 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12720&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2033)] | Joint meeting ETSI EEPS and Q7/5 |
| 2021-09-24 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12602&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2014)] | Q7/5 Rapporteur e-meeting |
| 2021-09-30 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12736&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2034)] | Q7/5 Rapporteur e-meeting |
| 2021-10-14 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12610&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2008)] | Q9/5 Rapporteur e-meeting |
| 2021-10-15 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12604&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2017)] | Q7/5 Rapporteur e-meeting |
| 2021-10-29 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12719&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2035)] | Q7/5 Rapporteur e-meeting |
| 2021-11-05 | E-Meeting | [Q12/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12627&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2050)] | Q12/5 Rapporteur e-meeting |
| 2021-11-08 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12774&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2068)] | Q9/5 Rapporteur e-meeting |
| 2021-11-11 | E-Meeting | [Q6/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12817&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2039)] | Q6/5 Rapporteur e-meeting |
| 2021-11-12 | E-Meeting | [Q7/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12799&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2036)] | Q7/5 Rapporteur e-meeting |
| 2021-11-25 | E-Meeting | [Q9/5](http://www.itu.int/net/ITU-T/lists/rgmdetails.aspx?id=12775&Group=5) [[Report](https://www.itu.int/md/T17-SG05-211130-TD-GEN-2067)] | Q9/5 Rapporteur e-meeting |

2 Organization of work

2.1 Organization of studies and allocation of work

**2.1.1** At its first meeting Study Group 5 decided to establish two working parties.

During the study period, a Focus Group was created to study the Environmental Efficiency of AI and other Emerging Technologies (FG-AI4EE).

The TSAG meeting held from 11 to 18 January 2021 endorsed a new set of Questions for SG5 ([TSAG-Report 14](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-TSAG-R-0014)). This set of Questions became effective on 18 January 2021, for the remainder of the study period.

**2.1.2** Table 2 shows the number and title of each working party as well as the number of Questions assigned and the Chairman of each party.

**2.1.3** Table 3 lists other groups created by Study Group 5 during the study period.

**2.1.4** In line with Resolution 54 (rev, Hammamet,2016) it was decided to continue with the Study Group 5 Regional Group for the Arab region, Study Group 5 Regional Group for Africa, and Study Group 5 Regional Group for Asia and the Pacific. It was decided that to create the Study Group 5 Regional Group for Latin America (SG5 RG-LATAM) and to conclude with the Study Group 5 Regional Group for the Americas.

**TABLE 2
Organization of Study Group 5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Designation** | **Questions to be studied** | **Title of the Working Party** | **Chairman and Vice-Chairmen** |
| PLEN | Q8/5; |  | Mick Maytum (Rapporteur) |
| WP1/5 | Q1/5; Q2/5; Q3/5; Q4/5; Q5/5\* (deleted); | EMC, lightning protection, EMF | Mr Lewicki Fryderyk (Chairman)Mr Gorini Beniamino (Vice-chairman)Mr Maytum Michael (Vice-chairman)Ms Zhang Xia (Vice-chairman)*Mr Havens Phillip (Inactive Vice-chairman)* |
| WP2/5 | Q6/5; Q7/5; Q9/5; Q10/5 (deleted); Q11/5; Q12/5; Q13/5 | Environment, Energy Efficiency, and the Circular Economy | Mr Gemma Paolo (Chairman)Ms Tewfik Nevine (Vice-chairman) |

\*Q5/5 was deleted and merged with Q1/5 during TSAG meeting 11-18 January 2021.

**TABLE 3
Other Groups (if any)**

|  |  |  |
| --- | --- | --- |
| **Title of the Group** | **Chairman** | **Vice-Chairmen** |
| ITU-T SG5 Regional Group for Asia and the Pacific | Ms Qi Shuguang | Mr Kim Byung ChanMr Takaya Kazuhiro |
| ITU-T SG5 Regional Group for Africa | Ms Nakiguli Helen Cynthia | Mr Houeyetongnon Jean BaptisteYetondjiMr Mnyippembe WilliamMs Tewfik Nevine |
| ITU-T SG5 Regional Group for Latin America | Mr. Miguel Felipe Anzola Espinosa | Mrs Ambrosi VivianaMr Victoria Christian |
| ITU-T SG5 Regional Group for the Arab Region | Ms Osman Eiman Farouk Mahmoud | Ms Al Sulaiti SalmaMr Alsaleem KhaledMr Rguigue AhmedMs Tewfik Nevine |

**2.2 Questions and Rapporteurs**

**2.2.1** WTSA-16 assigned to Study Group 5 the 10 Questions listed in Table 4a. TSAG during its meeting held from 11 to 18 January 2021, endorsed a new set of Questions for SG5 listed in Table 4b.

**2.2.2** The Questions listed in Table 5 have been adopted during this period.

**2.2.3** The Questions listed in Table 6 have been deleted during this period.

**TABLE 4a
Study Group 5 – Questions assigned by WTSA-16 and Rapporteurs**

| **Questions** | **Title of the Questions** | **WP** | **Rapporteur** | **Note** |
| --- | --- | --- | --- | --- |
| Q1/5 | Protection of information and communication technology (ICT) infrastructure from electromagnetic surges | WP1/5 | Mr Dai Chuanyou (Rapporteur)Mr Garcia Jean-Luc (Associate rapporteur)Mr Wang Huagang (Associate rapporteur) | Continuation of Q3/5 and Q5/5 |
| Q2/5 | Equipment resistibility and protective components | WP1/5 | Mr Maytum Michael (Rapporteur)*Mr Havens Phillip (Inactive Co-rapporteur)**Ms Gazivoda-Nikolic Tatjana (Inactive Associate rapporteur*)*Mr Kato Jun (Inactive Associate rapporteur)* | Continuation of Q2/5 and Q4/5 |
| Q3/5 | Human exposure to electromagnetic fields (EMFs) from information and communication technologies (ICTs) | WP1/5 | Mr Lewicki Fryderyk (Rapporteur)Mr Debattista Alfredo (Associate rapporteur)Mr Kim Byung Chan (Associate rapporteur)Mr Wood Mike (Associate rapporteur) | Continuation of Q7/5 |
| Q4/5 | Electromagnetic compatibility (EMC) issues arising in the telecommunication environment | WP1/5 | Mr Gorini Beniamino (Co-rapporteur)Mr Zhang Xing Hai (Co-rapporteur)Mr Takaya Kazuhiro (Associate rapporteur)Ms Zhang Xia (Associate rapporteur) | Continuation of Q6/5, Q8/5, Q9/5 and Q11/5 |
| Q5/5 | Security and reliability of information and communication technology (ICT) systems from electromagnetic and particle radiations | WP1/5 | Mr Okugawa Yuichiro (Rapporteur)Mr Iwashita Hidenori (Associate rapporteur) | Continuation of Q10/5 |
| Q6/5 | Achieving energy efficiency and smart energy | WP2/5 | Ms Qi Shuguang (Rapporteur)Mr Bianco Claudio (Associate rapporteur)*Mr Marquet Didier (Inactive Associate rapporteur)* | Continuation of Q17/5, Q19/5 and part of Q14/5 |
| Q7/5 | Circular economy including e-waste | WP2/5 | Ms Tewfik Nevine (Rapporteur)*Mrs Blom Marga (Inactive Co-rapporteur)*Mr Andrae Anders (Associate rapporteur)Ms Devia Leila (Associate rapporteur)Ms Lu Chunyang (Associate rapporteur)Ms Nakiguli Helen Cynthia (Associate rapporteur)Vaija Samuli (Associate rapporteur) | Continuation of Q13/5 |
| Q8/5 | Guides and terminology on environment and climate change | PLEN | Mr Maytum Michael (Rapporteur) | Continuation of Q12/5 (ex. Q10/5, renumbered to Q8/5) |
| Q9/5 | Climate change and assessment of information and communication technology (ICT) in the framework of the Sustainable Development Goals (SDGs) | WP2/5 | Ms Bergmark Pernilla (Co-rapporteur)Mr Canet Jean-Manuel (Co-rapporteur)*Mr Buty Gilbert (Inactive Associate rapporteur)Lu Yang (Inactive Associate rapporteur)Ms Tewfik Nevine (Inactive Associate rapporteur)Mr Hashitani Takafumi (Inactive Associate rapporteur)**Ms Lu Chunyang (Inactive Associate rapporteur)* | Continuation of Q18/5 and Q16/5 |
| Q10/5 | Adaptation to climate change and low cost and sustainable resilient information and communication technologies (ICTs) (DELETED) | WP2/5 | Ms Nevine Tewfik (Rapporteur)Mr Derick Simiyu Khamali (Associate Rapporteur) | Continuation of Q14/5 and Q15/5. (ex Q8/5 -renumbered to Q10/5) |

**TABLE 4b
Study Group 5 – Questions endorsed by TSAG (11-18 January 2021) and Rapporteurs**

| **Questions** | **Title of the Questions** | **WP** | **Rapporteur** | **Note** |
| --- | --- | --- | --- | --- |
| Q1/5 | Electrical protection, reliability, safety, and security of ICT systems | WP1/5 | Mr Dai Chuanyou (Rapporteur) Mr Iwashita Hidenori (Associate rapporteur) Mr Okugawa Yuichiro (Associate rapporteur) Mr Wang Huagang (Associate rapporteur) *Mr Garcia Jean-Luc (Inactive Associate rapporteur)* | Continuation of Q1/5 and Q5/5 |
| Q2/5 | Protecting equipment and devices against lightning and other electrical events | WP1/5 | Mr Maytum Michael (Rapporteur)Eiichi Kobayashi (Associate Rapporteur) *Mr Havens Phillip (Inactive Co-rapporteur) Mr Kato Jun (Inactive Associate rapporteur)* *Ms Gazivoda-Nikolic Tatjana (Inactive Associate rapporteur)* | Continuation of Q2/5 |
| Q3/5 | Human exposure to electromagnetic fields (EMFs) due to digital technologies | WP1/5 | Mr Lewicki Fryderyk (Rapporteur) Mr Debattista Alfredo (Associate rapporteur) Mr Kim Byung Chan (Associate rapporteur) Mr Wood Mike (Associate rapporteur) | Continuation of Q3/5 |
| Q4/5 | Electromagnetic compatibility (EMC) aspects in ICT environment | WP1/5 | Mr Gorini Beniamino (Co-rapporteur) Mr Zhang Xing Hai (Co-rapporteur) Mr Takaya Kazuhiro (Associate rapporteur) Ms Zhang Xia (Associate rapporteur) | Continuation of Q4/5 |
| Q6/5 | Environmental efficiency of digital technologies | WP2/5 | Ms Giannubilo Silvia (Co-rapporteur) Mr Nativi Stefano (Co-rapporteur) Mr Bianco Claudio (Associate rapporteur) Mr Olsson Magnus (Associate rapporteur) Ms Qi Shuguang (Associate rapporteur) *Mr Marquet Didier (Inactive Associate rapporteur)* | Continuation of part of Q6/5 |
| Q7/5 | E-waste, circular economy, and sustainable supply chain management | WP2/5 | Mr Navarro Leandro (Co-rapporteur) Ms Tewfik Nevine (Co-rapporteur) *Mrs Blom Marga (Inactive Co-rapporteur)* Mr Andrae Anders (Associate rapporteur) Ms Devia Leila (Associate rapporteur) Ms Lu Chunyang (Associate rapporteur) Ms Nakiguli Helen Cynthia (Associate rapporteur) Vaija Samuli (Associate rapporteur) | Continuation of Q7/5 |
| Q8/5 | Guides and terminology on environment | PLEN | Mr Maytum Michael (Rapporteur) | Continuation of Q8/5 |
| Q9/5 | Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement | WP2/5 | Ms Bergmark Pernilla (Co-rapporteur) Mr Canet Jean-Manuel (Co-rapporteur) *Mr Buty Gilbert (Inactive Associate rapporteur) Mr Hashitani Takafumi (Inactive Associate rapporteur) Ms Lu Chunyang (Inactive Associate rapporteur) Lu Yang (Inactive Associate rapporteur) Ms Tewfik Nevine (Inactive Associate rapporteur)* | Continuation of part of Q9/5 |
| Q11/5 | Climate change mitigation and smart energy solutions | WP2/5 |  Jeong Sangjin (Co-rapporteur) Ms Qi Shuguang (Co-rapporteur) | Continuation of part of Question 6/5 |
| Q12/5 | Adaptation to climate change through sustainable and resilient digital technologies | WP2/5 | Mr Bianco Claudio (Co-rapporteur) Mr Khamali Derick Simiyu (Co-rapporteur) Mrs Shi Ying (Associate rapporteur) | Continuation of part of Question 6/5 and part of Question 9/5 |
| Q13/5 | Building circular and sustainable cities and communities | WP2/5 | Mr Anthopoulos Leonidas (Rapporteur) Ms Onyara Virginia (Associate rapporteur) |  |

 **TABLE 5
Study Group 5 – New Questions adopted and Rapporteurs**

None

**TABLE 6
Study Group 5 – Questions deleted**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Questions** | **Title of the Questions** | **Rapporteur** | **Results** | **Note** |
| Q5/5 (deleted) | Security and reliability of information and communication technology (ICT) systems from electromagnetic and particle radiations | Mr Okugawa Yuichiro (Rapporteur) |  | Discontinued. Question 5/5 was merged with Question 1/5 on 18 January 2021, following endorsement by TSAG. |
| Q10/5 (deleted) | Adaptation to climate change and low cost and sustainable resilient information and communication technologies (ICTs) | Ms Nevine Tewfik (Rapporteur)Mr Derick Simiyu Khamali (Associate Rapporteur) | None | Discontinued in 2017. Continuation of Q14/5 and Q15/5 (Study period 2013-2016). |

3 Results of the work accomplished during the 2017-2020 study period

3.1 General

During the study period, Study Group 5 examined 902 contributions and generated a large number of TDs and liaison statements. It also:

**˗** developed 106 new Recommendations;

**˗** revised 62 existing Recommendations;

**˗** consented 13 Recommendations (of which 9 are revised Recommendations)

**˗** developed two corrigenda and seven appendixes;

**˗** deleted 1 Recommendation;

**˗** developed 32 Supplements;

**˗** developed 1 Technical Papers and Tutorial.

3.2 Highlights of achievements

The main results achieved on the various Questions assigned to Study Group 5 are briefly summarized below.

**A) Question 8/5 (PLEN) – Guides and terminology on environment and climate change**

During the study period, Question 8/5 has worked on the Terminology Handbook web version. Experts have also discussed on the ITU-T Recommendation skeleton and other ITU-T templates.

Questions 8/5 experts has been extracting the terms of the K and L series Recommendations.

**B) Working Party 1/5 achievements**

**Question 1/5 – Electrical protection, reliability, safety, and security of ICT systems**

During the study period, Question 1/5 developed new Recommendations on the protection of telecommunication systems against the effects of nearby lightning strikes and against disturbances from nearby electric power systems.

The new Recommendations include ITU-T K.125 “Dangerous effects and protective measures against electromagnetic disturbances when internet data centre is co-sited with high-voltage substation”, ITU-T K.134 “Protection of small-size telecommunication installations with poor earthing conditions”, ITU-T K.142 “Lightning protection and earthing of video surveillance system”, ITU-T K.146 “Management of interferences on telecommunication transmissions on copper other than speech”, and draft ITU-T K.151 (ex.K.HVAC\_400VDC) “Electrical safety and lightning protection of medium voltage input and up to ±400VDC output power system in ICT data centre and telecommunication centre”.

**Question 2/5 – Protecting equipment and devices against lightning and other electrical events**

During the study period, Question 2/5 produced new Recommendations and revised existing ones on the resistibility of ICT equipment and specifications, test methods and principles of application for protective components and assemblies.

The new Recommendations developed include ITU-T K.126 “Surge protective component application guide – High frequency signal isolation transformers”, ITU-T K.128 “Surge protective component application guide - Metal oxide varistor (MOV) components”, ITU-T K.129 “Characteristics and ratings of silicon PN junction voltage clamping components used for the protection of telecommunications installations”, ITU-T K.135 “Technical parameters for residual current operated protective devices with automatic reclosing feature for- telecom applications”, ITU-T K.140 “Surge protective component application guide - Fuses”, ITU-T K.143 “Guidance on safety relating to the use of surge protective devices and surge protective components in telecommunication terminal equipment”, ITU-T K.144 “Surge protective component application guide - Self-restoring thermally activated overcurrent protectors”, ITU-T K.147 “Ethernet port resistibility testing for overvoltages and overcurrents” and ITU-T K.148 “Multiservice surge protective device application guide”.

Q2/5 also produced Supplement 7 to ITU-T K.44 “AC supply configurations”, Supplement 8 to ITU-T K.series “Resistibility analysis of 5G systems”, Supplement 12 to ITU-T K.51 “Potential hazards of narrow pin spacing in connectors”, Supplement 15 to ITU-T K.20, K.21 and K.44 “Internal DC powering interface surge testing factors”, Supplement 17 to ITU-T K.44 “Test conditions and methods information”, Supplement 18 to ITU-T K.44 “Causes of telecommunication system overvoltage and overcurrent conditions and their expected levels”, Supplement 21 to ITU-T K.21 “Rationale for setting resistibility requirements of telecommunication equipment installed in customer premises against lightning” , Supplement 22 to ITU-T K.45 “Rationale for setting resistibility requirements of telecommunication equipment installed in the access and trunk networks against lightning”, Supplement 23 to ITU-T K.series “Ethernet port surge voltages and currents”, Supplement 24 to ITU-T K.20 “Rationale for setting resistibility requirements of telecommunication equipment installed in a telecommunication centre against lightning” and Supplement 25 to ITU-T K.117 “Long reach single twisted-pair Ethernet resistibility testing”.

**Question 3/5 – Human exposure to electromagnetic fields (EMFs) due to digital technologies**

During the study period, Question 3/5 produced a new Recommendation related to the assessment of RF EMF exposure limits at radiocommunication sites and facilities. Question 3/5 also worked to revise existing Recommendations and other informative texts related to EMFs.

The new Recommendation developed is ITU-T K.145 “Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities”.

Question 3/5 also produced Supplement 9 to ITU-T K. series “5G technology and human exposure to RF EMF”, Supplement 13 to ITU-T K.series “Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use”, Supplement 14 to ITU-T K.series “The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment”, Supplement 16 to ITU-T K. series “Electromagnetic field (EMF) compliance assessments for 5G wireless networks​”, Supplement 19 to ITU-T K. series “EMF strength inside subway train”, and Supplement 20 to ITU-T K.series “RF Exposure evaluation around base station installed underground”.

Question 3/5 also revised Appendix 1 of ITU-T K.70 (Appendix I to Recommendation ITU-T K.70) “Software "EMF-estimator" v8.0.32 and v8.64”.

**Question 4/5 – Electromagnetic compatibility (EMC) aspects in ICT environment**

During the study period, Question 4/5 developed new Recommendations and revised existing ones on the EMC requirements (e.g., emission and immunity) for ICT equipment, including both wireless and wireline equipment, and electric and electronic equipment installed in telecommunication facilities.

The new Recommendations include ITU-T K.127 “Immunity requirements for telecommunication equipment in close proximity use of wireless devices”, ITU-T K.133 “Electromagnetic (EM) environment of body worn equipment in the 2.4 GHz and 13.56 MHz industrial, scientific and medical band”, ITU-T K.132 “EMC requirements of electromagnetic disturbances from lighting equipment located in telecommunication facilities”, ITU-T K. 136 “Electromagnetic Compatibility requirements for radio telecommunication equipment”, ITU-T K. 137 “Electromagnetic compatibility requirements and measurement methods for wire-line telecommunication network equipment”, ITU-T K.141 “​Electromagnetic compatibility requirements for Information Perception Equipment” and ITU-T K.149 “Passive intermodulation test methods of array antenna systems in mobile communication systems”.

Question 4/5 also produced Supplement 10 “Analysis of EMC aspects and definition of requirements for 5G mobile systems” and Supplement 26 to ITU-T K.series “Analysis of electromagnetic compatibility requirements and test methods of 5G active antenna system base stations”.

**Question 5/5 – (Discontinued) Security and reliability of information and communication technology (ICT) systems from electromagnetic and particle radiations (From 2027 to 2020)**

During the study period, Question 5/5 developed new Recommendations and revised existing ones on the requirements against soft errors and threat by electromagnetic phenomena in order to improve and maintain the reliability and safety of ICT systems.

The new Recommendations include ITU-T K.131 “Design methodologies for telecommunication systems applying soft error measures”, ITU-T K.130 “Neutron irradiation test methods for telecommunications equipment”, 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​” and ITU-T K.150 “Information of semiconductor devices required for the design of telecommunication equipment applying soft error mitigation measures”.

Question 5/5 also produced Supplement 11 “Soft error measures for field programmable gate arrays”.

**C) Working Party 2/5 achievements**

**Question 6/5 – Environmental efficiency of digital technologies**

During the study period, Question 6/5 developed new Recommendations and revised existing ones on setting the requirements for low-cost and environmentally sustainable ICT equipment, energy efficient architectures, energy saving features and energy saving solutions in ICTs, and energy efficiency metrics, KPIs, measurement methods, technical requirements related to ICT infrastructures in order to reduce their environmental impacts.

The new Recommendations include ITU-T L.1220 “innovative energy storage technology for stationary use - Part 1: Overview of energy storage”, ITU-T L.1206 “​Impact on ICT equipment architecture of multiple AC, -48VDC or up to 400 VDC power inputs”, ITU-T L.1332 “Total network infrastructure Energy efficiency metrics”, ITU-T L.1221 “Innovative energy storage technology for stationary use - Part 2: Battery”, ITU-T L.1222 “Innovative energy storage technology for stationary use - Part 3: Supercapacitor technology”, ITU-T L. 1303 “Functional requirements and framework of green data centre energy-saving management system”, ITU-T L.1361 “Measurement method for energy efficiency of Network Function Virtualization”, ITU-T L.1370 “Sustainable and intelligent building services”, ITU-T L.1371 “A methodology for assessing and scoring the sustainability performance of office buildings”, ITU-T L.1507 “Use of ICT sites to support environmental sensing”, ITU-T L.1362 “Interface for power management in NFV environments "Green Abstraction Layer 2", ITU-T L.1210 “Sustainable power-feeding solutions for 5G networks”, ITU-T L.1305 “Data centre infrastructure management system based on big data and artificial intelligence technology”, ITU-T L.1316 “Energy efficiency framework”, ITU-T L.1380 “Smart energy solution for telecom sites”, ITU-T L.1381 “Smart energy solutions for data centres”, ITU-T L.1382 “Smart energy solutions for telecommunication rooms”, ITU-T L.1304 “Procurement criteria for sustainable data centres”, ITU-T L.1317 “Guidelines on Energy Efficient Blockchain Systems”, and draft revised ITU-T L.1331 “Assessment of mobile network energy efficiency”.

Question 6/5 also produced Supplement 36 to Recommendation ITU-T L.1310 “Study on methods and metrics to evaluate energy efficiency for future 5G systems”, Supplement 40 to Recommendation ITU-T L.1371 “Scoring tool to assess the sustainability performance of office buildings”, Supplement 41 “Requirements on energy efficiency measurement models and the role of artificial intelligence and big data”, Supplement 42 “Guidelines on the environmental efficiency of machine learning processes in supply chain management”, Supplement 43 “Smart energy saving of 5G base stations: Traffic forecasting and strategy optimization of 5G wireless network energy consumption based on artificial intelligence and other emerging technologies” and Supplement ITU-T L.Suppl.45 to ITU‑T L.1350 “Radio base station site best practices”

**Question 7/5 – E-waste, circular economy, and sustainable supply chain management**

During the study period, Question 7/5 developed new Recommendations and revised existing ones related to the sustainable management of e-waste based on circular economy principles.

The new Recommendations include ITU-T L.1021 “Extended Producer Responsibility (EPR) Guidelines for Sustainable E-waste Management”, ITU-T L.1020 “Circular Economy: Guide for Operators and Suppliers on approaches to migrate towards circular ICT goods and networks”, ITU-T L.1031 “Guideline on implementing the e-waste reduction target of the Connect 2020 Agenda​”, ITU-T L.1015 “Criteria for evaluation of the environmental impact of mobile phones”. ITU-T L.1032 “Guidelines and Certification Schemes for e-Waste Recyclers”, ITU-T L.1022 “Circular Economy: Definitions and concepts for material efficiency for ICT”,ITU-T L.1023 “Assessment method for circular scoring”, ITU-T L.1024 “Effect for global ICT of the potential of selling services instead of equipment on the waste creation and environmental impacts”, ITU-T L.1033 “Guide for the institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste”, ITU-T L.1060 “General principles for the green supply chain management of ICT manufacturing industry”, draft ITU-T L.1050 “Methodology to identify key equipment in order to assess the environmental impact and e-waste generation of different network architectures”, draft ITU-T L.1035.(ex. L.SM\_Batteries) “Sustainable Management of Batteries”, draft ITU-T L.1016 (ex. L.TWS) “Method for Evaluation of the Environmental, Health and Safety Performance of True Wireless Stereo Headphones” and draft ITU-T L.1036 (ex. L.ewaste\_base-station) “Scheduled waste management for base station (inclusive of e-waste)”.

**Question 9/5 – Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement**

During the study period, Question 9/5 developed a new Recommendation on assessing the environmental and sustainability impacts of ICT at different levels taking into account the Sustainable Development Goals and the UNFCCC Paris agreement.

The new Recommendations include ITU-T L.1505 “Use of ICT in the adaptation of the Fisheries Sector to the Effects of Climate Change”, ITU-T L.1506 “Framework of climate change risk assessment for telecommunication and electrical facilities”, ITU-T L.1450 “Methodologies for the assessment of the environmental impact of the information and communication technology sector”, ITU-T L.1451 “Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors”, ITU-T L.1460 “Connect 2020 greenhouse gases emissions - Guidelines”, ITU-T L.1470 “GHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement” and ITU-T L.1471 “Guidance and criteria for ICT organisations on setting Net Zero targets and strategies”.

Questions 9/5 also produced Supplement 37 to Recommendation ITU-T L.1470 “Guidance to operators of mobile networks, fixed networks and data centres on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470”, and Supplement 38 to Recommendation ITU-T L.1470 “Guidance to information and communication technology manufacturers on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470”.

**Question 11/5 – Climate change mitigation and smart energy solutions**

Q11/5 started its work in May 2021. Q11/5 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. It has developed Recommendation ITU-T L.1383 “Smart energy solutions for city and home applications” and Supplement ITU-T L.Suppl.44 “A Guideline on best practices and environment friendly policies for effective ICT deployment methods”.

**Question 12/5 – Adaptation to climate change through sustainable and resilient digital technologies**

Q12/5 started its work in May 2021. Q12/5 would improve the efficiency of power and cooling systems in ICT networks, support the development of energy efficiency ICT architectures such as up to 400 VDC power feeding systems, add energy saving features to ICTs equipment and applications, improve air flow controlling technology, cooling technology and renewable energy systems and more. It 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 the development of a new Recommendation on Sustainable and Resilient Digital Technologies for Adaptation to Climate Change and a Supplement on Overview on Adaptation to Climate Change for ICT Networks.

**Question 13/5 – Building circular and sustainable cities and communities**

Q13/5 started its work in May 2021. The circular economy concept has primarily been applied only to the economic sphere. Yet, the circular economy principles hold great potential in improving sustainability in cities and communities. Sharing, recycling, refurnishing, reusing, replacing, and digitizing are identified as some of the circular actions that can be applied to a wide-range of city assets. Q13/5 aims to develop standards, guidance, 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 draft Recommendations on “City Science Application Framework”, “Development framework for bioeconomy in cities and communities”, “Framework of building infrastructure management system for sustainable city” and “Guide to Circular Cities”. Q13/5 is also working on the development of two Supplements on “Guidelines for connecting cities and communities with the Sustainable Development Goal” and “Case studies on city science application framework”. Q13/5 produced Supplement ITU-T L.Suppl.46 “Definitions and Recent Trends in Circular Cities”.

3.3 Report of lead study group activities, Focus Groups, JCAs and regional groups

**3.3.1 Lead study group activities**

Study Group 5 served 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

**˗** circular economy, including e‑waste

Study Group 5 developed and updated:

**˗** ITU-T Recommendations on Human Exposure to Electromagnetic Fields, available at: <http://www.itu.int/net/ITU-T/lists/standards.aspx?Group=5&Domain=40>

**˗** Green ICT Standards and Supplements, available at:
<http://www.itu.int/net/ITU-T/lists/standards.aspx?Group=5&Domain=28>

**ITU-T SG5 Vision on Setting the Environmental Requirements for 5G (2017-2020)**

The 5G evolution is expected to fundamentally change the lives of many. As 5G rollout begins in many parts of the world, ITU-T SG5 has been contributing to the process by developing technical reports, supplements and international standards that study the environmental aspects of 5G.

More information on the standards and supplements developed on the environmental requirements for 5G is available [here](https://www.itu.int/en/ITU-T/climatechange/Pages/ictccenv.aspx).

**ITU-T Study Group 5 contribution to the Connect 2020 and Connect 2030 Agenda**

The targets under the Connect 2030 Agenda under its sustainability goal are:

**˗** Target 3.2: By 2023, increase the global e-waste recycling rate to 30%

**˗** Target 3.3: By 2023, raise the percentage of countries with an e-waste legislation to 50%

**˗** Target 3.4: By 2023, net telecommunication/ICT-enabled greenhouse gas abatement should have increased by 30% compared to the 2015 baseline

**˗** In this regard, ITU-T SG5 is contributing to the accomplishment of the Connect 2030 (and Connect 2020 Agenda) with Standards such as:

**˗** Recommendation ITU-T L.1031 which helps countries to reduce e-waste by 50%. This Recommendation provides a guidance on developing an e-waste inventory, approaches to design e-waste prevention and reduction programmes.

**˗** Recommendation ITU-T L.1460 provides guidance on how to decrease the GHG emissions generated by the telecommunication/ICT sector.

The following Recommendations are also related to the Connect 2030 Agenda

**˗** Recommendation ITU-T L.1450 “Methodologies for the assessment of the environmental impact of the information and communication technology sector” which provides a methodology for calculating the information and communication technology (ICT) sector footprint with respect to life cycle greenhouse gases (GHG) emissions; and for defining GHG emissions budget for the ICT sector considering a 2 ºC or lower trajectory.

**˗** Recommendation ITU-T L.1470 “Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement” provides detailed trajectories of greenhouse gas (GHG) emissions for the global information and communication technology (ICT) sector and sub-sectors that are quantified for the year 2015 and estimated for 2020, 2025 and 2030.

**˗** Recommendation ITU-T L.1471 “Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies” provides guidance to information and communication technology (ICT) organizations in clarifying the meaning of Net Zero in the context of the ICT sector and setting Net Zero targets and strategies. It also identifies actions that would lead the sector towards Net Zero according to the trajectories described in Recommendation ITU T L.1470.

Additionally, ITU-T SG5 is working on:

**˗** Draft Recommendation ITU-T L.Enablement “Assessment of GHG emissions reductions enabled by ICT services in support of the Net Zero transition”

**˗** Draft Recommendation ITU-T L.Virtual Meetings “Methodology for estimating GHG emissions in the frame of virtual meetings and events”

**˗** Draft Recommendation ITU-T L.Database “Guidance for the creation of an ITU database on GHG emissions of the global ICT sector”

**SG5 organized the following symposia, workshops, smart environment panels, webinars and forums on Environment, Climate Change and Circular Economy:**

**˗** [7th ITU Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201704/Pages/default.aspx)
3-5 April 2017, Manizales, Colombia

**˗** [Forum on "The gender dimension in ICT and Environment through innovation and entrepreneurship"](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201704/Pages/programme-20170404.aspx)
4 April 2017 (morning only), Manizales, Colombia

**˗** [Forum on "Environment, climate change and circular economy"](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201704/Pages/programme-20170404-05.aspx)
4 April (afternoon) - 5 April (morning) 2017, Manizales, Colombia

**˗** [ITU-ETSI workshop Towards Setting Environmental Requirements for 5G](http://www.etsi.org/news-events/events/1217-towards-setting-environmental-requirements-for-5g)
23 November 2017, Sophia Antipolis, France

**˗** [ITU Workshop on "5G, EMF & Health"](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20171205/Pages/default.aspx)
5 December 2017, Warsaw, Poland

**˗** [The role of International Standards and of the Basel Convention in tackling e-waste and achieving a Circular Economy](https://www.itu.int/net4/wsis/forum/2018/Pages/Agenda/Session/340#intro)
23 March 2018, Geneva, Switzerland

**˗** [12th ITU Symposium on ICT, Environment and Climate Change](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201804/Pages/Programme09.aspx)
9 April 2018, Zanzibar, Tanzania

**˗** [8th ITU Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201804/Pages/default.aspx)
9-12 April 2018, Zanzibar, Tanzania

**˗** [Forum & Training on With ICTs everywhere - How safe is EMF?](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201804/Pages/programme10.aspx)
10 April 2018, Zanzibar, Tanzania

**˗** [Information session on ITU-T Study Group 5 Activities on Environment, Climate Change and Circular Economy](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/Information-Session-20181203-ITU-T-SG5-Activities.aspx)
3 December 2018, Wuxi, China

**˗** [Thematic Workshop on Connecting the Circular model of E-waste Management to the Sustainable Development Goals](https://www.itu.int/net4/wsis/forum/2019/Agenda/ViewSession/240)
11 April 2019 (14h30 - 16h15), Room K2, ITU headquarters, Geneva, Switzerland

**˗** [13th Symposium on ICT, Environment and Climate Change](https://www.itu.int/en/ITU-T/climatechange/symposia/201905/Pages/default.aspx)
13 May 2019, Geneva, Switzerland

**˗** [STI Forum Side Event: Frontier Technologies to Protect the Environment and Tackle Climate Change](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/event-20190514.aspx)
14 May 2019, New York, UNHQ

**˗** [Smart Environment Panel on GHG emissions trajectories for the ICT sector](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/event-20190515.aspx)
15 May 2019 (11h30-13h00), Geneva, Switzerland

**˗** [Smart Environment Panel on New ITU standards on soft errors that affect telecommunications](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/event-20190520.aspx)
20 May 2019 (18h00-19h00), Geneva, Switzerland

**˗** [HLPF Side Event: "Harnessing Frontier Technologies for Accelerating Climate Actions and the SDGs"](https://www.itu.int/en/ITU-T/climatechange/Pages/20190709.aspx)
9 July 2019, New York, UNHQ

**˗** [1st Digital African Week](https://www.itu.int/en/ITU-T/climatechange/Pages/1st-Digital-African-Week.aspx), 27-30 August 2019, Abuja, Nigeria

**˗** [1st Digital African Week: Forum on "Human Exposure to Electromagnetic Fields (EMFs) in Africa"](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rgafr/20190829/Pages/default.aspx)
29 August 2019 (afternoon only), Abuja, Nigeria

**˗** [1st Digital African Week: ITU Training on "E-waste Management and Circular Economy"](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rgafr/201903/Pages/default.aspx)
30 August 2019 (morning only), Abuja, Nigeria

**˗** [ITU Telecom World: Session on "Frontier technologies for climate change"](https://telecomworld.itu.int/2019-event/forum/)
11 September 2019 (11h00-12h15), Budapest, Hungary

**˗** [Forum on Environmental Efficiency for AI and other Emerging Technologies](https://www.itu.int/en/ITU-T/climatechange/Pages/20191014-forum.aspx)
11 December 2019, Vienna, Austria

**˗** [ITU Telecom World: Session on "Strategies to boost climate action in the ICT sector"](https://telecomworld.itu.int/2019-event/forum/)
11 September 2019 (9h15-10h30), Budapest, Hungary

**˗** [9th Green Standards Week: Forum on "Frontier Technologies to Tackle Climate Change and Achieve a Circular Economy"](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201910/Pages/programme-04.aspx)
1 October 2019, Valencia, Spain

**˗** [1st Meeting of the ITU-T Focus Group on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (FG-AI4EE)](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/default.aspx)
12 December 2019, Vienna, Austria​

**˗** [Webinar: Using international standards to tackle the e-waste challenge](https://www.itu.int/en/ITU-T/climatechange/Documents/Events/Webinar_%20using_%20international_%20standards_to_tackle_the_e-waste_challenge.pdf)
1 April 2020, 10:00 hours, Geneva time

2 April 2020, 16:00 hours, Geneva time

**˗** [Webinar: Explore a circular vision for the ICT sector](https://www.itu.int/en/ITU-T/climatechange/Documents/Events/Webinar_explore_a_circular_vision_%20for_the_ICT_sector.pdf)
14 April 2020, 10:00 hours, Geneva time
16 April 2020, 16:00 hours, Geneva time

**˗** [Session on "Using international standards to build smart sustainable cities and tackle climate change, e-waste and nature loss​"](https://www.itu.int/en/ITU-T/climatechange/Pages/20201015.aspx)Virtual session, 15 October 2020, 13h30 to 15h00, Geneva time

**˗** [Virtual Forum on Human Exposure to electromagnetic fields (EMFs) due to digital technologies](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2021/0510/Pages/default.aspx)
Virtual, 10 May 2021

**˗** [Session on the Emerging Technology Week 2021: Towards a sustainable digital transformation and a net-zero emission with emerging technology New](https://www.itu.int/en/ITU-D/Conferences/ET/2021/Pages/Programme.aspx)
Virtual, 8 July 2021

**˗** [VEF Side Event: Unlocking the potential of digital technologies for a sustainable energy transition](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/ITU-T-SG5-side-event-on-Vienna-Energy-Forum.aspx)
Virtual, 6 July 2021​

**˗** [Side event: International Standards and Sustainable Green & Innovative Power Solutions to bring Broadband Internet Connectivity to Rural and Remote Areas](https://www.itu.int/en/action/environment-and-climate-change/Pages/Side-event-International-Standards-and-Sustainable-Green-%26-Innovative-Power-Solutions.aspx)

Virtual, 22 June 2021

**˗** [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx)

Virtual, 28-30 September 2021

• [Sustainable Digital Transformation in Africa](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/20210928/Pages/default.aspx), Virtual, 28 September 2021

• [Sustainable Digital Transformation in the Arab Region](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/20210929/Pages/default.aspx), Virtual, 29 September 2021

• [Sustainable Digital Transformation in Latin America](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/20210930/Pages/default.aspx), Virtual, 30 September 2021

**˗** [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)
Virtual, 19 October 2021

**˗** [COP26 - UNFCCC Global Innovation Hub – "How do we accelerate Climate Action? Digital innovation, collaboration, and the path to net zero"](https://www.itu.int/en/action/environment-and-climate-change/Pages/cop26.aspx)
Glasgow, 3 November 2021

**˗** [Unlocking Net Zero in Cities Through Sustainable Digital Transformation and Innovative Solutions](https://www.itu.int/en/action/environment-and-climate-change/Pages/cop26.aspx)
Glasgow, 11 November 2021

**˗** [10th Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/202112/Pages/default.aspx)
Virtual, 14-16 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), 14 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)​, 15 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), 16 December 2021

**The following publications and reports on Environment, Climate Change and Circular Economy have been published on Study Period 2017-2020:**

**˗** [Turning Digital Technology Innovation into Climate Action](https://www.itu.int/en/publications/Documents/tsb/2019-Turning-digital-technology-innovation-into-climate-action/index.html) - 2019

**˗** [Year in Review and Upcoming Activities 2019-2020 Brochure](https://www.itu.int/en/ITU-T/climatechange/Documents/Year%20in%20Review/year-in-review-and-upcoming-activities-2019-2020.pdf) - 2020

**˗** [Executive Summary: Frontier technologies to protect the environment and tackle climate change](https://www.itu.int/en/publications/Documents/tsb/2020-Frontier-technologies-to-protect-the-environment-and-tackle-climate-change-Executive-Summary/index.html) - 2020

**˗** [Frontier technologies to protect the environment and tackle climate change](https://www.itu.int/en/publications/Documents/tsb/2020-Frontier-Technologies-to-Protect-the-Environment-and-Tackle-Climate-Change/index.html) – 2020

**˗** [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) (available in Spanish) - 2021

**A Global Portal on Environment and Smart Sustainable Cities** highlights the latest external resources related to six distinct topics, including; smart sustainable cities; cities’ actions to tackle Covid-19; energy efficient ICTs; climate change; e-waste management and circular economy; and frontier technologies (e.g., AI, IoT, blockchain). The site also contains Calendar of Events on Environment and Smart Sustainable Cities. The Global Portal is available [here](https://www.itu.int/en/ITU-T/climatechange/resources/Pages/env-and-ssc.aspx).

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

FG-AI4EE works to identify the standardization needs to develop a sustainable approach to AI and other emerging technologies including automation, augmented reality, virtual reality, extended reality, smart manufacturing, industry 5.0, cloud/edge computing, nanotechnology, 5G, among others. The group looks to address the environmental aspects of emerging technologies, including water and energy consumption, and to provide guidance to stakeholders on implementing and operating these technologies in an environmentally sound manner in order to meet the 2030 Agenda for Sustainable Development Goals.

FG-AI4EE provides an open platform for relevant stakeholders – such as representatives of vertical industries, regulators, policy makers, researchers, engineers, practitioners, entrepreneurs, services providers, platform providers, network operators; international organizations, industry forums and consortia – to share knowledge, best practices and lessons learned in the field.

The work of FG-AI4EE is being carried out by three working groups; WG1 - Requirements of AI and other Emerging Technologies to Ensure Environmental Efficiency; WG2 - Assessment and Measurement of the Environmental Efficiency of AI and Emerging Technologies; and WG3 - Implementation Guidelines of AI and Emerging Technologies for Environmental Efficiency.

Mr Paolo Gemma and Mr Neil Sahota act as the Co-Chairmen of FG-AI4EE.

The FG-AI4EE has held the following meetings:

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Meeting** | **Venue and Date** | **Report** |
| 1 | First meeting of FG-AI4EE | Vienna, Austria; 12 December 2019 | [Report 1](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) |
| 2 | Second meeting of FG-AI4EE | Virtual, 10 December 2020 | [Report 2](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) |
| 3 | Third meeting of FG-AI4EE | Virtual, 8 April 2021 | [Report 3](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Documents/Report%20of%20ITU%20FG-AI4EE%203rd%20meeting%2C%2008%20April%202021.docx) |
| 4 | Fourth meeting of FG-AI4EE | Virtual, 21 October 2021 | [Report 4](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Documents/Report%20of%20ITU%20FG-AI4EE%204th%20meeting%2C%2021%20October%202021.docx) |

As of October 2021, the FG-AI4EE has approved 11 deliverables. The FG-AI4EE requested an extension of its work until December 2022. This request was approved.

**3.3.3** **Regional Group for Africa (SG5 RG-AFR)**

In accordance with WTSA Resolution 54 (Creation of regional groups), Resolution 72 (Measurement concerns related to human exposure to electromagnetic fields), Resolution 73 (Information and communication technologies, environment and climate change) and Resolution 79 (The role of telecommunications / information and communication technology in handling and controlling e-waste from telecommunication and information technology equipment and methods of treating it), ITU-T Study Group 5, at its meeting in 2009, created the SG5 Regional Group for Africa and updated its terms of reference in May 2017.

The objectives of this Regional Group include, but are not limited to, the dissemination of the studies on electromagnetic environment, human exposure to electromagnetic field (EMF), e-waste and circular economy, achieving energy efficiency, smart energy and utilizing ICTs for climate change; to encourage the participation of its countries in the SG5 events; and to establish a link to attend to the needs of African countries on the issues covered by SG5 mandate.

Ms Helen Cynthia Nakiguli (Uganda) is the Chairman of the ITU-T SG5 Regional Group for Africa. Mr Jean Baptiste Yetondji Houeyetongnon (Benin), Mr William Mnyippembe (Tanzania), and Ms Nevine Tewfik (Egypt) are the Vice-Chairmen of the group.

Three meetings were held: Virtual, (28 September 2021), Abuja, Nigeria (29-30 August 2019), Zanzibar, Tanzania (9 April 2018).

The meetings have been held during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx) (28-30 September 2021), the [1st Digital African Week](https://www.itu.int/en/ITU-T/climatechange/Pages/1st-Digital-African-Week.aspx) 27-30 August 2019, Abuja, Nigeria and the [8th ITU Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201804/Pages/default.aspx) (9-12 April 2018, Zanzibar, Tanzania).

|  |  |
| --- | --- |
| **Place, date** | **Reports** |
| Zanzibar, 9 April 2018 | [SG5RG-AFR-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.AFR-R-0001) |
| Abuja, 29-30 August 2019 | [SG5RG-AFR-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.AFR-R-0002) |
| Virtual, 28 September 2021 | [SG5RG-AFR-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.AFR-R-0003) |

**3.3.4** **Regional Group for the Arab Region (SG5 RG-ARB)**

In accordance with WTSA Resolution 54 (Creation of regional groups), Resolution 72 (Measurement concerns related to human exposure to electromagnetic fields), Resolution 73 (Information and communication technologies, environment and climate change) and Resolution 79 (The role of telecommunications / information and communication technology in handling and controlling e-waste from telecommunication and information technology equipment and methods of treating it), ITU-T Study Group 5, at its meeting in February 2013, created the ITU-T SG5 Regional Group for Arab region and updated its terms of reference in May 2017.

The objectives of this Regional Group include, but are not limited to, the dissemination of the studies on electromagnetic environment, human exposure to electromagnetic field (EMF), e-waste and circular economy, achieving energy efficiency, smart energy and utilizing ICT for dealing with climate change; to encourage the participation of its countries in the SG5 events and to establish a link to attend to the needs of Arab countries on the issues covered by SG5 mandate.

Mr Eiman Farouk Mahmoud Osman (the Republic of Sudan) is the Chairman of the ITU-T SG5 Regional Group for the Arab Region, and Ms Salma Al Sulaiti (Qatar), Mr Khaled Alsaleem (Kuwait), Mr Ahmed Rguigue (Mauritania) and Ms Nevine Mounir Tewfik Loutfi (Egypt) are the Vice-Chairmen of the group.

Three meetings were held: Virtual, 29 September 2021, Kuwait City, Kuwait (18 December 2018), Zanzibar, Tanzania (10 April 2018).

The meetings have been held during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx) (28-30 September 2021) and [8th ITU Green Standards Week](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/gsw/201804/Pages/default.aspx) (9-12 April 2018, Zanzibar, Tanzania).

|  |  |
| --- | --- |
| **Place, date** | **Reports** |
| Zanzibar, 10 April 2018 | [SG5RG-ARB-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.ARB-R-0001) |
| Kuwait City, 18 December 2018 | [SG5RG-ARB-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.ARB-R-0002) |
| Virtual, 29 September 2021 | [SG5RG-ARB-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.ARB-R-0003) |

**3.3.5** **Regional Group for Latin America (SG5 RG-LATAM)**

This regional group is created in accordance with WTSA Resolution 44 and Resolution 54 (Hammamet, 2016). SG5RG-LATAM will also support the implementation of Resolution 72 on “Measurement concerns related to human exposure to electromagnetic fields” (Hammamet, 2016), Resolution 73 on “Information and communication technologies, environment and climate change” (Hammamet, 2016) and Resolution 79 on “The role of telecommunications/information and communication technologies in handling and controlling e-waste from telecommunication and information technology equipment and methods of treating it” (Dubai, 2012); and will help Study Group 5 to assume its additional responsibilities following WTSA-2016 (Hammamet, 2016).

Mr Miguel Felipe Anzola Espinoza (Colombia) is the Chairman of the ITU-T SG5 Regional Group for Latin America. Mr Christian Victoria (The Dominican Republic) and Ms Viviana Ambrosi (Argentina) are the Vice-Chairmen of the group.

Four meetings were held: Virtual (30 September 2021), Virtual (10 November 2020), Bogota, Colombia (24 October 2018), Cartagena, Colombia (19 April 2018).

The fourth meeting was held during the [Sustainable Digital Transformation Dialogues](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/sg05rg/sdtd/Pages/default.aspx) (28-30 September 2021).

|  |  |
| --- | --- |
| **Place, date** | **Reports** |
| Cartagena de Indias, 19 April 2018 | [SG5RG-LATAM-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.LATAM-R-0001) |
| Bogota, 24 October 2018 | [SG5RG-LATAM-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.LATAM-R-0002) |
| Virtual meeting, 10 November 2020 | [SG5RG-LATAM-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.LATAM-R-0003) |
| Virtual meeting, 30 September 2021 | [SG5RG-LATAM-R4](https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/sg5rglatam/Pages/default.aspx) |

**3.3.6** **Regional Group for Asia and the Pacific (SG5 RG-AP)**

In accordance with WTSA Resolution 54 (Creation of regional groups), Resolution 72 (Measurement concerns related to human exposure to electromagnetic fields), Resolution 73 (Information and communication technologies, environment and climate change) and Resolution 79 (The role of telecommunications / information and communication technology in handling and controlling e-waste from telecommunication and information technology equipment and methods of treating it), ITU-T Study Group 5, at its meeting in February 2013, created the ITU-T SG5 Regional Group for Asia Pacific and the Pacific and updated its terms of reference in May 2017.

The objectives of this Regional Group include, but are not limited to, the dissemination of the studies on electromagnetic environment, human exposure to electromagnetic fields (EMFs), e-waste and circular economy, achieving energy efficiency, smart energy and utilizing ICT for dealing with climate change; to encourage the participation of its countries in the SG5 events; and to establish a link to attend to the needs of Member States of Asia and the Pacific on the issues covered by SG5 mandate.

Mr Shuguang Qi (China) is the Chairman of the ITU-T SG5 Regional Group for Asia and the Pacific. Mr Byung Chan Kim (Rep. of Korea) and Mr Kazuhira Takaya (Japan) are the Vice-Chairmen of the group.

Three meetings were held: Virtual (19-20 October 2021), Virtual (15-16 April 2021) and Virtual (29-30 September 2020).

|  |  |
| --- | --- |
| **Place, date** | **Reports** |
| Virtual meeting, 29-30 September 2020 | [SG5RG-AP-R1](https://www.itu.int/md/T17-SG05RG.AP-R-0001/en) |
| Virtual meeting, 15-16 April 2021 | [SG5RG-AP-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.AP-R-0002) |
| Virtual meeting, 19-20 October 2021 | [SG5RG-AP-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG05RG.AP-R-0003) |

The third 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) (19 October 2021).

4 Observations concerning future work

ITU-T SG5 will continue to be the leading Study Group on topics related to; ICT safety and reliability; resistibility against lightning and electrical events; human exposure to electromagnetic fields (EMF); and the electromagnetic compatibility (EMC) aspects of ICTs. In order to accommodate for the emerging issues associated with EMF and other related aspects of digital technologies, ITU-T SG5 should expand on its work to include digital technologies and next generation infrastructure.

ITU-T SG5 will also continue to contribute to the global climate change efforts by; enhancing energy efficiency in ICTs; studying solution to mitigate the effect of climate change; studying smart energy solutions for ICTs; minimizing the environmental impacts of ICTs; and supporting the use of ICTs to achieve the Sustainable Development Goals and a Carbon reduction emission of ICT and other sectors, as well as assessment methodologies to support these. In addition, ITU-T SG5 is also developing methodologies associated with ICT impacts on biodiversity. In the light of growing demands for digital technologies, ITU-T SG5 will also take the initiative to study the environmental aspects of digital technologies.

In order to accommodate for the emerging sustainability concerns associated with rapid urbanization, ITU-T SG5 is also looking to support cities and communities to become more circular through its standardization efforts. To this end, ITU-T SG5 will continue to work on “Building circular and sustainable cities and communities”.

5 Updates to the WTSA Resolution 2 for the 2017-2020 study period

Annex 2 contains the updates to WTSA Resolution 2 as proposed by Study Group 5 concerning the general areas of study, title, mandate, lead roles and guidance areas in the next study period.

ANNEX 1

List of Recommendations, Supplements and
other materials produced or deleted during the study period

The list of new and revised Recommendations approved during the study period is found in Table 7.

The list of Recommendations determined/consented at the last meeting of Study Group 5 is found in Table 8.

The list of Recommendations deleted by Study Group 5 during the study period is found in Table 9.

The List of Recommendations submitted by Study Group 5 to WTSA-16 for approval is found in Table 10.

Tables 11 onwards list other publications approved and/or deleted by Study Group 5 during the study period.

**TABLE 7
Study Group 5 – Recommendations approved during the study period**

| ***Recommendation*** | ***Approval*** | ***Status*** | ***TAP/AAP*** | ***Title (English)*** |
| --- | --- | --- | --- | --- |
| [K.20](http://handle.itu.int/11.1002/1000/13126) | 2016-12-14 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/13272) | 2017-07-29 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/13629) | 2018-10-22 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/13950) | 2019-07-14 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/14067) | 2019-11-13 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/14723) | 2021-06-29 | In force | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/13127) | 2016-12-14 | Superseded | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/13273) | 2017-07-29 | Superseded | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/13630) | 2018-10-22 | Superseded | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/13951) | 2019-07-14 | In force | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.21 (2019) Amd. 1](http://handle.itu.int/11.1002/1000/14290) | 2020-06-29 | In force | AAP | Amendment 1 to Recommendation ITU-T K.21: Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.34](http://handle.itu.int/11.1002/1000/14566) | 2020-12-14 | In force | AAP | Classification of electromagnetic environmental conditions for telecommunication equipment – Basic EMC Recommendation |
| [K.35](http://handle.itu.int/11.1002/1000/13443) | 2018-01-13 | Superseded | AAP | Bonding configurations and earthing at remote electronic sites |
| [K.35](http://handle.itu.int/11.1002/1000/14567) | 2020-12-14 | In force | AAP | Bonding configurations and earthing at remote electronic sites |
| [K.39](http://handle.itu.int/11.1002/1000/14068) | 2019-11-13 | In force | AAP | Risk assessment of damages to telecommunication sites due to lightning discharges |
| [K.40](http://handle.itu.int/11.1002/1000/13444) | 2018-01-13 | Superseded | AAP | Protection against lightning electromagnetic impulses in telecommunication centres |
| [K.40](http://handle.itu.int/11.1002/1000/14069) | 2019-11-13 | In force | AAP | Protection against lightning electromagnetic impulses in telecommunication centres |
| [K.44](http://handle.itu.int/11.1002/1000/13128) | 2017-05-24 | Superseded | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation |
| [K.44](http://handle.itu.int/11.1002/1000/13631) | 2018-10-22 | Superseded | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation |
| [K.44](http://handle.itu.int/11.1002/1000/13952) | 2019-10-22 | In force | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation |
| [K.44 (2019) Cor. 1](http://handle.itu.int/11.1002/1000/14573) | 2020-12-14 | In force | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendation - Corrigendum 1 |
| [K.45](http://handle.itu.int/11.1002/1000/13129) | 2016-12-14 | Superseded | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.45](http://handle.itu.int/11.1002/1000/13274) | 2017-07-29 | Superseded | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.45](http://handle.itu.int/11.1002/1000/13632) | 2018-07-14 | Superseded | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.45](http://handle.itu.int/11.1002/1000/13953) | 2019-10-22 | In force | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.45 (2019) Amd. 1](http://handle.itu.int/11.1002/1000/14291) | 2020-06-29 | In force | AAP | Amendment 1 to Recommendation ITU-T K.45: Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.50](http://handle.itu.int/11.1002/1000/13130) | 2016-12-14 | Superseded | AAP | Safe limits for operating voltages and currents of telecommunication systems powered over the network |
| [K.50](http://handle.itu.int/11.1002/1000/13445) | 2018-01-13 | In force | AAP | Safe limits for operating voltages and currents of telecommunication systems powered over the network |
| [K.50 (2018) Amd. 1](http://handle.itu.int/11.1002/1000/14292) | 2020-06-29 | In force | AAP | Amendment 1 to Recommendation ITU-T K.50: Safe limits for operating voltages and currents of telecommunication systems powered over the network. |
| [K.50 (2018) Cor. 1](http://handle.itu.int/11.1002/1000/14574) | 2020-12-14 | In force | AAP | Safe limits for operating voltages and currents in telecommunication systems powered over the network-Corrigendum 1 |
| [K.50 (2018) Cor. 2](http://handle.itu.int/11.1002/1000/14712) | 2021-07-14 | In force | AAP | Safe limits for operating voltages and currents in telecommunication systems powered over the network - Corrigendum 2 |
| [K.52](http://handle.itu.int/11.1002/1000/13131) | 2016-12-14 | Superseded | AAP | Guidance on complying with limits for human exposure to electromagnetic fields |
| [K.52](http://handle.itu.int/11.1002/1000/13446) | 2018-01-13 | Superseded | AAP | Guidance on complying with limits for human exposure to electromagnetic fields |
| [K.52 (2018) Amd. 1](http://handle.itu.int/11.1002/1000/13790) | 2018-09-21 | Superseded | Agreement | Appendix V - Calculator for equivalent isotropic radiated power as described in Recommendation ITU-T K.52 |
| [K.52](http://handle.itu.int/11.1002/1000/14724) | 2021-06-29 | In force | AAP | Guidance on complying with limits for human exposure to electromagnetic fields |
| [K.56 (2010) Cor. 1](http://handle.itu.int/11.1002/1000/13275) | 2017-07-29 | Superseded | AAP | Protection of radio base stations against lightning discharges - Corrigendum 1 |
| [K.56](http://handle.itu.int/11.1002/1000/14293) | 2021-05-21 | In force | AAP | Protection of radio base stations against lightning discharges |
| [K.61](http://handle.itu.int/11.1002/1000/13447) | 2018-01-13 | In force | AAP | Guidance on measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installations |
| [K.64](http://handle.itu.int/11.1002/1000/14294) | 2020-06-29 | In force | AAP | Safe working practices for outside equipment installed in particular environments |
| [K.66](http://handle.itu.int/11.1002/1000/14070) | 2019-11-13 | In force | AAP | Protection of customer premises from overvoltages |
| [K.70](http://handle.itu.int/11.1002/1000/13448) | 2018-01-13 | Superseded | AAP | Mitigation techniques to limit human exposure to EMFs in the vicinity of radiocommunication stations |
| [K.70 (2018) Amd. 1](http://handle.itu.int/11.1002/1000/13647) | 2018-05-25 | Superseded | Agreement | Appendix I – New version v.7.01 of the software EMF-estimator |
| [K.70 (2018) Amd. 2](http://handle.itu.int/11.1002/1000/13791) | 2018-09-21 | Superseded | Agreement | Software EMF-estimator |
| [K.70](http://handle.itu.int/11.1002/1000/14568) | 2020-12-14 | In force | AAP | Mitigation techniques to limit human exposure to EMFs in the vicinity of radiocommunication stations |
| [K.70 (2020) Amd. 1](http://handle.itu.int/11.1002/1000/14880) | 2021-12-10 | In force | Agreement | Software "EMF-estimator" v8.0.32 and v8.64 |
| [K.73](http://handle.itu.int/11.1002/1000/14071) | 2019-11-13 | In force | AAP | Shielding and bonding for cables between buildings |
| [K.77](http://handle.itu.int/11.1002/1000/13954) | 2019-07-14 | In force | AAP | Characteristics of metal oxide varistors for the protection of telecommunication installations |
| [K.78](http://handle.itu.int/11.1002/1000/14569) | 2020-12-14 | In force | AAP | High altitude electromagnetic pulse immunity guide for telecommunication centres |
| [K.83](http://handle.itu.int/11.1002/1000/14295) | 2020-06-29 | Superseded | AAP | Monitoring of electromagnetic field levels |
| [K.83](http://handle.itu.int/11.1002/1000/14875) | 2022-01-13 | In force | AAP | Monitoring of electromagnetic field levels |
| [K.90](http://handle.itu.int/11.1002/1000/13633) | 2018-07-14 | In force | AAP | Evaluation techniques and working procedures for compliance with exposure limits of network operator personnel to power-frequency electromagnetic fields |
| [K.90 (2018) Amd. 1](http://handle.itu.int/11.1002/1000/13934) | 2019-05-22 | In force | Agreement | Update to Appendix II - Software "EMFACDC" v 2.0 |
| [K.90 (2018) Amd. 2](http://handle.itu.int/11.1002/1000/14749) | 2021-05-20 | In force | Agreement | Amendment 2 – Revisions of Appendix II |
| [K.91](http://handle.itu.int/11.1002/1000/13276) | 2017-07-29 | Superseded | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.91](http://handle.itu.int/11.1002/1000/13449) | 2018-01-13 | Superseded | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.91 (2018) Amd. 1](http://handle.itu.int/11.1002/1000/13796) | 2018-09-21 | Superseded | Agreement | Appendix IX - Manhole type base station |
| [K.91 (2018) Amd. 2](http://handle.itu.int/11.1002/1000/13797) | 2018-09-21 | Superseded | Agreement | Appendix X - EMF monitoring and information platform |
| [K.91 (2018) Amd. 3](http://handle.itu.int/11.1002/1000/13935) | 2019-05-22 | Superseded | Agreement | New Appendix IX – Manhole type base station |
| [K.91](http://handle.itu.int/11.1002/1000/14072) | 2019-11-13 | Superseded | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.91](http://handle.itu.int/11.1002/1000/14296) | 2020-06-29 | Superseded | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.91](http://handle.itu.int/11.1002/1000/14570) | 2020-12-14 | Superseded | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.91](http://handle.itu.int/11.1002/1000/14876) | 2022-01-13 | In force | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields |
| [K.93](http://handle.itu.int/11.1002/1000/13132) | 2016-12-14 | In force | AAP | Immunity of home network devices to electromagnetic disturbances |
| [K.98 (2014) Cor. 2](http://handle.itu.int/11.1002/1000/14297) | 2020-06-29 | In force | AAP | Corrigendum 2 to Recommendation ITU-T K.98: Overvoltage protection guide for telecommunication equipment installed in customer premises |
| [K.99](http://handle.itu.int/11.1002/1000/13277) | 2017-07-29 | In force | AAP | Surge protective component application guide - Gas discharge tubes |
| [K.100](http://handle.itu.int/11.1002/1000/13278) | 2017-07-29 | Superseded | AAP | Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service |
| [K.100](http://handle.itu.int/11.1002/1000/13450) | 2018-01-13 | Superseded | AAP | Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service |
| [K.100](http://handle.itu.int/11.1002/1000/13955) | 2019-07-14 | Superseded | AAP | Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service |
| [K.100](http://handle.itu.int/11.1002/1000/14725) | 2021-06-29 | In force | AAP | Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service |
| [K.112](http://handle.itu.int/11.1002/1000/13956) | 2019-07-14 | Superseded | AAP | Lightning protection, earthing and bonding: Practical procedures for radio base stations |
| [K.112](http://handle.itu.int/11.1002/1000/14298) | 2021-05-21 | In force | AAP | Lightning protection, earthing and bonding: Practical procedures for radio base stations |
| [K.116](http://handle.itu.int/11.1002/1000/13957) | 2019-07-14 | In force | AAP | Electromagnetic compatibility requirements and test methods for radio telecommunication terminal equipment |
| [K.117](http://handle.itu.int/11.1002/1000/13133) | 2016-12-14 | In force | AAP | Primary protector parameters for the surge protection of equipment Ethernet ports |
| [K.118](http://handle.itu.int/11.1002/1000/13134) | 2016-12-14 | In force | AAP | Requirements for lightning protection of fibre to the distribution point equipment |
| [K.119](http://handle.itu.int/11.1002/1000/13135) | 2016-12-14 | In force | AAP | Conformance assessment of radio base stations regarding lightning protection and earthing |
| [K.120](http://handle.itu.int/11.1002/1000/13136) | 2016-12-14 | In force | AAP | Lightning protection and earthing of a miniature base station |
| [K.121](http://handle.itu.int/11.1002/1000/13137) | 2016-12-14 | In force | AAP | Guidance on the environmental management for compliance with radio frequency EMF limits for radiocommunication base stations |
| [K.121 (2016) Amd. 1](http://handle.itu.int/11.1002/1000/13646) | 2018-05-25 | In force | Agreement | New Appendix II - Management of RF-EMF compliance for shared radiocommunication sites |
| [K.122](http://handle.itu.int/11.1002/1000/13138) | 2016-12-14 | In force | AAP | Exposure levels in close proximity of radiocommunication antennas |
| [K.123](http://handle.itu.int/11.1002/1000/13139) | 2016-12-14 | Superseded | AAP | Electromagnetic compatibility requirements for electrical equipment in telecommunication facilities |
| [K.123](http://handle.itu.int/11.1002/1000/13958) | 2019-07-14 | In force | AAP | Electromagnetic compatibility requirements for electrical equipment in telecommunication facilities |
| [K.124](http://handle.itu.int/11.1002/1000/13140) | 2016-12-14 | Superseded | AAP | Overview of particle radiation effects on telecommunication systems |
| [K.124](http://handle.itu.int/11.1002/1000/14933) | 2022-01-13 | In force | AAP | Overview of particle radiation effects on telecommunication systems |
| [K.125](http://handle.itu.int/11.1002/1000/13279) | 2017-07-29 | In force | AAP | Dangerous effects and protective measures against electromagnetic disturbances when an Internet data centre is co-sited with a high-voltage substation |
| [K.126](http://handle.itu.int/11.1002/1000/13280) | 2017-07-29 | In force | AAP | Surge protective component application guide - High frequency signal isolation transformers |
| [K.127](http://handle.itu.int/11.1002/1000/13281) | 2017-07-29 | In force | AAP | Immunity requirements for telecommunication equipment in close proximity use of wireless devices |
| [K.128](http://handle.itu.int/11.1002/1000/13451) | 2018-01-13 | In force | AAP | Surge protective component application guide - metal oxide varistor (MOV) components |
| [K.129](http://handle.itu.int/11.1002/1000/13452) | 2018-01-13 | In force | AAP | Characteristics and ratings of silicon PN junction voltage clamping components used for the protection of telecommunication installations |
| [K.130](http://handle.itu.int/11.1002/1000/13453) | 2018-01-13 | Superseded | AAP | Neutron irradiation test methods for telecommunication equipment |
| [K.130](http://handle.itu.int/11.1002/1000/14934) | 2022-01-13 | In force | AAP | Neutron irradiation test methods for telecommunication equipment |
| [K.131](http://handle.itu.int/11.1002/1000/13454) | 2018-01-13 | Superseded | AAP | Design methodologies for telecommunication systems applying soft error measures |
| [K.131](http://handle.itu.int/11.1002/1000/14935) | 2022-01-13 | In force | AAP | Design methodologies for telecommunication systems applying soft error measures |
| [K.132](http://handle.itu.int/11.1002/1000/13455) | 2018-01-13 | In force | AAP | Electromagnetic compatibility requirements of electromagnetic disturbances from lighting equipment located in telecommunication facilities |
| [K.133](http://handle.itu.int/11.1002/1000/13456) | 2018-01-13 | In force | AAP | Electromagnetic environment of body-worn equipment in the 2.4 GHz and 13.56 MHz industrial, scientific and medical band |
| [K.134](http://handle.itu.int/11.1002/1000/13713) | 2018-11-13 | In force | AAP | Protection of small-size telecommunication installations with poor earthing conditions |
| [K.135](http://handle.itu.int/11.1002/1000/13714) | 2018-11-13 | In force | AAP | Technical parameters for residual current operated protective devices with automatic reclosing feature for telecom applications |
| [K.136](http://handle.itu.int/11.1002/1000/13715) | 2018-11-13 | In force | AAP | Electromagnetic compatibility requirements for radio telecommunication equipment |
| [K.137](http://handle.itu.int/11.1002/1000/13716) | 2018-11-13 | Superseded | AAP | Electromagnetic compatibility requirements and measurement methods for wire-line telecommunication network equipment |
| [K.137](http://handle.itu.int/11.1002/1000/14936) | 2022-01-13 | In force | AAP | Electromagnetic compatibility requirements and measurement methods for wireline telecommunication network equipment |
| [K.138](http://handle.itu.int/11.1002/1000/13717) | 2018-11-13 | Superseded | AAP | Quality estimation methods and application guidelines for mitigation measures based on particle radiation tests |
| [K.138](http://handle.itu.int/11.1002/1000/14937) | 2022-01-13 | In force | AAP | Quality estimation methods and application guidelines for mitigation measures based on particle radiation tests |
| [K.139](http://handle.itu.int/11.1002/1000/13718) | 2018-11-13 | Superseded | AAP | Reliability requirements for telecommunication systems affected by particle radiation |
| [K.139](http://handle.itu.int/11.1002/1000/14938) | 2022-01-13 | In force | AAP | Reliability requirements for telecommunication systems affected by particle radiation |
| [K.140](http://handle.itu.int/11.1002/1000/13959) | 2019-07-14 | In force | AAP | Surge protective component application guide - Fuses |
| [K.141](http://handle.itu.int/11.1002/1000/13960) | 2019-07-14 | In force | AAP | Electromagnetic compatibility requirements for information perception equipment |
| [K.142](http://handle.itu.int/11.1002/1000/14073) | 2019-11-13 | In force | AAP | Lightning protection and earthing of video surveillance systems |
| [K.143](http://handle.itu.int/11.1002/1000/14074) | 2019-11-13 | In force | AAP | Guidance on safety relating to the use of surge protective devices and surge protective components in telecommunication terminal equipment |
| [K.144](http://handle.itu.int/11.1002/1000/14075) | 2019-11-13 | In force | AAP | Surge protective component application guide - Self-restoring thermally activated overcurrent protectors |
| [K.145](http://handle.itu.int/11.1002/1000/14076) | 2019-11-13 | Superseded | AAP | Assessment and management of compliance with radio frequency electromagnetic field exposure limits for workers at radiocommunication sites and facilities |
| [K.145](http://handle.itu.int/11.1002/1000/14571) | 2020-12-14 | In force | AAP | Assessment and management of compliance with radio frequency electromagnetic field exposure limits for workers at radiocommunication sites and facilities |
| [K.146](http://handle.itu.int/11.1002/1000/14299) | 2020-06-29 | In force | AAP | Interference management for telecommunication transmissions over copper lines for signals other than speech |
| [K.147](http://handle.itu.int/11.1002/1000/14300) | 2020-06-29 | Superseded | AAP | Ethernet port resistibility testing for overvoltages and overcurrents |
| [K.147 (2020) Cor. 1](http://handle.itu.int/11.1002/1000/14575) | 2021-01-06 | Superseded | AAP | Ethernet port resistibility testing for overvoltages and overcurrents - Corrigendum 1 |
| [K.147](http://handle.itu.int/11.1002/1000/14726) | 2022-01-13 | In force | AAP | Protection of networked information technology equipment |
| [K.148](http://handle.itu.int/11.1002/1000/14561) | 2020-12-14 | In force | AAP | Multiservice surge protective device application guide |
| [K.149](http://handle.itu.int/11.1002/1000/14562) | 2020-12-14 | In force | AAP | Passive intermodulation test methods of array antenna systems in mobile communication systems |
| [K.150](http://handle.itu.int/11.1002/1000/14563) | 2020-12-14 | In force | AAP | Information of semiconductor devices required for the design of telecommunication equipment applying soft error mitigation measures |
| [K.151](http://handle.itu.int/11.1002/1000/14846) | 2022-01-13 | In force | AAP | Electrical safety and lightning protection of medium voltage input and up to ±400VDC output power system in ICT data centre and telecommunication centre |
| [L.1000](http://handle.itu.int/11.1002/1000/13961) | 2019-07-14 | In force | AAP | Universal power adapter and charger solution for mobile terminals and other hand-held ICT devices |
| [L.1006](http://handle.itu.int/11.1002/1000/13142) | 2016-12-14 | In force | AAP | Test suites for assessment of the external universal power adapter solutions for stationary information and communication technology devices |
| [L.1007](http://handle.itu.int/11.1002/1000/13143) | 2016-12-14 | In force | AAP | Test suites for assessment of the external universal power adapter solutions for portable information and communication technology devices |
| [L.1015](http://handle.itu.int/11.1002/1000/13719) | 2019-05-22 | In force | AAP | Criteria for evaluation of the environmental impact of mobile phones |
| [L.1020](http://handle.itu.int/11.1002/1000/13457) | 2018-01-13 | In force | AAP | Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks |
| [L.1021](http://handle.itu.int/11.1002/1000/13458) | 2018-04-06 | In force | AAP | Extended producer responsibility - Guidelines for sustainable e-waste management |
| [L.1022](http://handle.itu.int/11.1002/1000/13962) | 2019-10-22 | In force | AAP | Circular economy: Definitions and concepts for material efficiency for information and communication technology |
| [L.1023](http://handle.itu.int/11.1002/1000/14301) | 2020-09-22 | In force | AAP | Assessment method for circular scoring |
| [L.1024](http://handle.itu.int/11.1002/1000/14564) | 2021-01-06 | In force | AAP | The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global information and communication technology |
| [L.1030](http://handle.itu.int/11.1002/1000/13577) | 2018-06-13 | In force | AAP | E-waste management framework for countries |
| [L.1031](http://handle.itu.int/11.1002/1000/13720) | 2018-11-13 | Superseded | AAP | Guideline on implementing the e-waste reduction target of the Connect 2020 Agenda |
| [L.1031](http://handle.itu.int/11.1002/1000/14572) | 2020-12-14 | In force | AAP | Guideline for achieving the e-waste targets of the Connect 2030 Agenda |
| [L.1032](http://handle.itu.int/11.1002/1000/13963) | 2019-08-13 | In force | AAP | Guidelines and certification schemes for e-waste recyclers |
| [L.1033](http://handle.itu.int/11.1002/1000/14715) | 2021-10-22 | In force | AAP | Guidance for institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste |
| [L.1050](http://handle.itu.int/11.1002/1000/14716) | 2022-01-13 | In force | AAP | Methodology to identify the key equipment in order to assess the environmental impact and e-waste generation of different network architectures |
| [L.1060](http://handle.itu.int/11.1002/1000/14717) | 2021-07-14 | In force | AAP | General principles for the green supply chain management of information and communication technology manufacturing industry |
| [L.1205](http://handle.itu.int/11.1002/1000/13144) | 2016-12-14 | In force | AAP | Interfacing of renewable energy or distributed power sources to up to 400 VDC power feeding systems |
| [L.1206](http://handle.itu.int/11.1002/1000/13282) | 2017-07-29 | In force | AAP | Impact on ICT equipment architecture of multiple AC, -48VDC or up to 400 VDC power inputs |
| [L.1207](http://handle.itu.int/11.1002/1000/13578) | 2018-05-14 | In force | AAP | Progressive migration of a telecommunication/information and communication technology site to 400 VDC sources and distribution |
| [L.1210](http://handle.itu.int/11.1002/1000/14079) | 2019-12-22 | In force | AAP | Sustainable power-feeding solutions for 5G networks |
| [L.1220](http://handle.itu.int/11.1002/1000/13283) | 2017-08-13 | In force | AAP | Innovative energy storage technology for stationary use - Part 1: Overview of energy storage |
| [L.1221](http://handle.itu.int/11.1002/1000/13721) | 2018-11-13 | In force | AAP | Innovative energy storage technology for stationary use - Part 2: Battery |
| [L.1222](http://handle.itu.int/11.1002/1000/13579) | 2018-05-14 | In force | AAP | Innovative energy storage technology for stationary use - Part 3: Supercapacitor technology |
| [L.1303](http://handle.itu.int/11.1002/1000/13722) | 2018-11-13 | In force | AAP | Functional requirements and framework of green data centre energy-saving management system |
| [L.1304](http://handle.itu.int/11.1002/1000/14565) | 2020-12-14 | In force | AAP | Procurement criteria for sustainable data centres |
| [L.1305](http://handle.itu.int/11.1002/1000/14080) | 2019-11-13 | In force | AAP | Data centre infrastructure management system based on big data and artificial intelligence technology |
| [L.1310](http://handle.itu.int/11.1002/1000/13284) | 2017-07-29 | Superseded | AAP | Energy efficiency metrics and measurement methods for telecommunication equipment |
| [L.1310](http://handle.itu.int/11.1002/1000/14302) | 2020-09-22 | In force | AAP | Energy efficiency metrics and measurement methods for telecommunication equipment |
| [L.1315](http://handle.itu.int/11.1002/1000/13145) | 2017-05-24 | In force | AAP | Standardization terms and trends in energy efficiency |
| [L.1316](http://handle.itu.int/11.1002/1000/14081) | 2019-11-13 | In force | AAP | Energy efficiency framework |
| [L.1317](http://handle.itu.int/11.1002/1000/14718) | 2021-11-22 | In force | AAP | Guidelines on energy efficient blockchain systems |
| [L.1325](http://handle.itu.int/11.1002/1000/13146) | 2016-12-14 | In force | AAP | Green ICT solutions for telecom network facilities |
| [L.1331](http://handle.itu.int/11.1002/1000/13147) | 2017-04-06 | Superseded | AAP | Assessment of mobile network energy efficiency |
| [L.1331](http://handle.itu.int/11.1002/1000/14303) | 2020-09-22 | Superseded | AAP | Assessment of mobile network energy efficiency |
| [L.1331](http://handle.itu.int/11.1002/1000/14940) | 2022-01-13 | In force | AAP | Assessment of mobile network energy efficiency |
| [L.1332](http://handle.itu.int/11.1002/1000/13459) | 2018-01-13 | In force | AAP | Total network infrastructure energy efficiency metrics |
| [L.1351](http://handle.itu.int/11.1002/1000/13580) | 2018-08-22 | In force | AAP | Energy efficiency measurement methodology for base station sites |
| [L.1360](http://handle.itu.int/11.1002/1000/13148) | 2016-12-14 | In force | AAP | Energy control for the software-defined networking architecture |
| [L.1361](http://handle.itu.int/11.1002/1000/13723) | 2018-11-13 | In force | AAP | Measurement method for energy efficiency of network functions virtualization |
| [L.1362](http://handle.itu.int/11.1002/1000/13964) | 2019-08-13 | In force | AAP | Interface for power management in network function virtualization environments – Green abstraction Layer version 2 |
| [L.1370](http://handle.itu.int/11.1002/1000/13724) | 2018-11-13 | In force | AAP | Sustainable and intelligent building services |
| [L.1371](http://handle.itu.int/11.1002/1000/14304) | 2020-06-29 | In force | AAP | A methodology for assessing and scoring the sustainability performance of office buildings |
| [L.1380](http://handle.itu.int/11.1002/1000/14082) | 2019-11-13 | In force | AAP | Smart energy solution for telecom sites |
| [L.1381](http://handle.itu.int/11.1002/1000/14305) | 2020-06-29 | In force | AAP | Smart energy solutions for data centres |
| [L.1382](http://handle.itu.int/11.1002/1000/14306) | 2020-06-29 | In force | AAP | Smart energy solution for telecommunication rooms |
| [L.1383](http://handle.itu.int/11.1002/1000/14719) | 2021-10-07 | In force | AAP | Smart energy solutions for city and home applications |
| [L.1450](http://handle.itu.int/11.1002/1000/13581) | 2018-09-21 | In force | AAP | Methodologies for the assessment of the environmental impact of the information and communication technology sector |
| [L.1451](http://handle.itu.int/11.1002/1000/14083) | 2019-11-13 | In force | AAP | Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors |
| [L.1460](http://handle.itu.int/11.1002/1000/13582) | 2018-08-22 | In force | AAP | Connect 2020 greenhouse gases emissions - Guidelines |
| [L.1470](http://handle.itu.int/11.1002/1000/14084) | 2020-01-12 | In force | AAP | Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement |
| [L.1471](http://handle.itu.int/11.1002/1000/14720) | 2021-09-22 | In force | AAP | Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies |
| [L.1504](http://handle.itu.int/11.1002/1000/13149) | 2016-12-14 | In force | AAP | ICT and adaptation of agriculture to the effects of climate change |
| [L.1505](http://handle.itu.int/11.1002/1000/13460) | 2018-01-13 | In force | AAP | Information and communication technology and adaptation of the fisheries sector to the effects of climate change |
| [L.1506](http://handle.itu.int/11.1002/1000/13461) | 2018-01-13 | In force | AAP | Framework of climate change risk assessment for telecommunication and electrical facilities |
| [L.1507](http://handle.itu.int/11.1002/1000/13965) | 2019-07-14 | In force | AAP | Use of ICTsites to support environmental sensing |

**TABLE 8
Study Group 5 – Recommendations consented/determined at the last meeting**

| **Recommendation** | **Consent/Determination** | **TAP/AAP** | **Title** |
| --- | --- | --- | --- |
| [L.1035](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14875) | 2021-12-10 | AAP | Sustainable Management of Batteries |
| [L.1016](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16840) | 2021-12-10 | AAP | Method for Evaluation of the Environmental, Health and Safety Performance of True Wireless Stereo Headphones |
| [L.1036](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=15277) | 2021-12-10 | AAP | Scheduled waste management for base station (inclusive of e-waste) |

**TABLE 9
Study Group 5 – Recommendation or Supplement deleted during study period**

|  |  |  |  |
| --- | --- | --- | --- |
| **Recommendation/ Supp** | **Last version** | **Withdrawal date** | **Title (English)** |
| K Suppl. 2 | 2014-12-19 | 2018-09-21 | ITU-T K.52 - Calculator for equivalent isotropic radiated power as described in Recommendation ITU-T K.52 |

**TABLE 10
Study Group 5 – Recommendations submitted to WTSA-16**

| **Recommendation** | **Proposal** | **Title** | **Reference** |
| --- | --- | --- | --- |
| *None* |  |  |  |

**TABLE 11
Study Group 5 – Supplements**

| ***Recommendation*** | ***Approval*** | ***Status*** | ***Title (English)*** |
| --- | --- | --- | --- |
| [K Suppl. 1](http://handle.itu.int/11.1002/1000/14316) | 2020-05-20 | Superseded | ITU-T K.91 – Guide on electromagnetic fields and health |
| [K Suppl. 1](http://handle.itu.int/11.1002/1000/14750) | 2021-05-20 | In force | ITU-T K.91 – Guide on electromagnetic fields and health |
| [K Suppl. 4](http://handle.itu.int/11.1002/1000/13792) | 2018-09-21 | In force | ITU-T K.91 - Electromagnetic field considerations in smart sustainable cities |
| [K Suppl. 7](http://handle.itu.int/11.1002/1000/13271) | 2017-05-24 | In force | ITU-T K.44 – AC supply configurations |
| [K Suppl. 8](http://handle.itu.int/11.1002/1000/13472) | 2017-11-22 | In force | Resistibility analysis of 5G systems |
| [K Suppl. 9](http://handle.itu.int/11.1002/1000/13473) | 2017-11-22 | Superseded | 5G technology and human exposure to RF EMF |
| [K Suppl. 9](http://handle.itu.int/11.1002/1000/13939) | 2019-05-22 | In force | 5G technology and human exposure to radiofrequency electromagnetic fields |
| [K Suppl. 10](http://handle.itu.int/11.1002/1000/13474) | 2017-11-22 | In force | Analysis of electromagnetic compatibility aspects and definition of requirements for 5G mobile systems |
| [K Suppl. 11](http://handle.itu.int/11.1002/1000/13475) | 2017-11-22 | Superseded | ITU-T K.131 – Soft error measures of field programmable gate arrays |
| [K Suppl. 11](http://handle.itu.int/11.1002/1000/13793) | 2018-09-21 | In force | ITU-T K.131 – Soft error measures for field programmable gate arrays |
| [K Suppl. 12](http://handle.itu.int/11.1002/1000/13644) | 2018-05-25 | In force | ITU-T K.51 – Potential hazards of narrow pin spacing in connectors |
| [K Suppl. 13](http://handle.itu.int/11.1002/1000/13645) | 2018-05-25 | Superseded | Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use |
| [K Suppl. 13](http://handle.itu.int/11.1002/1000/14881) | 2021-12-10 | In force | Radiofrequency electromagnetic field (RF-EMF) exposure levels from mobile and portable devices during different conditions of use |
| [K Suppl. 14](http://handle.itu.int/11.1002/1000/13643) | 2018-05-25 | Superseded | The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment |
| [K Suppl. 14](http://handle.itu.int/11.1002/1000/14077) | 2019-09-20 | In force | The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment |
| [K Suppl. 15](http://handle.itu.int/11.1002/1000/13794) | 2018-09-21 | In force | ITU-T K.20, K.21 and K.44 – Internal DC powering interface surge testing factors |
| [K Suppl. 16](http://handle.itu.int/11.1002/1000/13795) | 2018-09-21 | Superseded | Electromagnetic field compliance assessments for 5G wireless networks |
| [K Suppl. 16](http://handle.itu.int/11.1002/1000/13938) | 2019-05-22 | In force | Electromagnetic field compliance assessments for 5G wireless networks |
| [K Suppl. 17](http://handle.itu.int/11.1002/1000/13936) | 2019-05-22 | In force | ITU-T K.44 – Test conditions and methods information |
| [K Suppl. 18](http://handle.itu.int/11.1002/1000/13937) | 2019-05-22 | In force | ITU-T K.44 – Causes of telecommunication system overvoltage and overcurrent conditions and their expected levels |
| [K Suppl. 19](http://handle.itu.int/11.1002/1000/14078) | 2019-09-20 | In force | Electromagnetic field (EMF) strength inside underground railway trains |
| [K Suppl. 20](http://handle.itu.int/11.1002/1000/14317) | 2020-05-20 | Superseded | ITU-T K.91 – Supplement on radiofrequency exposure evaluation around underground base stations |
| [K Suppl. 20](http://handle.itu.int/11.1002/1000/14882) | 2021-12-10 | In force | ITU-T K.91 – Supplement on radiofrequency exposure evaluation around underground base stations |
| [K Suppl. 21](http://handle.itu.int/11.1002/1000/14579) | 2020-10-23 | Superseded | Rationale for setting resistibility requirements of telecommunication equipment installed in customer premises against lightning |
| [K Suppl. 21](http://handle.itu.int/11.1002/1000/14751) | 2021-05-20 | In force | ITU-T K.21 – Rationale for setting resistibility requirements of telecommunication equipment installed in customer premises against lightning |
| [K Suppl. 22](http://handle.itu.int/11.1002/1000/14580) | 2020-10-23 | Superseded | Rationale for setting resistibility requirements of telecommunication equipment installed in the access and trunk networks against lightning |
| [K Suppl. 22](http://handle.itu.int/11.1002/1000/14752) | 2021-05-20 | In force | ITU-T K.45 – Rationale for setting resistibility requirements of telecommunication equipment installed in the access and trunk networks against lightning |
| [K Suppl. 23](http://handle.itu.int/11.1002/1000/14581) | 2020-10-23 | In force | Ethernet port surge voltages and currents |
| [K Suppl. 24](http://handle.itu.int/11.1002/1000/14753) | 2021-05-20 | In force | ITU-T K.20 – Rationale for setting resistibility requirements of telecommunication equipment installed in a telecommunication centre against lightning |
| [K Suppl. 25](http://handle.itu.int/11.1002/1000/14754) | 2021-05-20 | In force | ITU-T K.117 - Long reach single twisted-pair Ethernet resistibility testing |
| [K Suppl. 26](http://handle.itu.int/11.1002/1000/14755) | 2021-05-20 | In force | ITU-T K.114 - Analysis of electromagnetic compatibility requirements and test methods of 5G active antenna system base stations |
| [L Suppl. 36](http://handle.itu.int/11.1002/1000/13476) | 2017-11-22 | In force | ITU-T L.1310 – Study on methods and metrics to evaluate energy efficiency for future 5G systems |
| [L Suppl. 37](http://handle.itu.int/11.1002/1000/14318) | 2020-05-20 | In force | Guidance to operators of mobile networks, fixed networks, and data centres on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470 |
| [L Suppl. 38](http://handle.itu.int/11.1002/1000/14582) | 2020-10-23 | In force | Guidance to information and communication technology manufacturers on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470 |
| [L Suppl. 40](http://handle.itu.int/11.1002/1000/14583) | 2020-10-23 | In force | Scoring tool to assess the sustainability performance of office buildings |
| [L Suppl. 41](http://handle.itu.int/11.1002/1000/14761) | 2021-05-20 | In force | Requirements on energy efficiency measurement models and the role of artificial intelligence and big data |
| [L Suppl. 42](http://handle.itu.int/11.1002/1000/14756) | 2021-05-20 | In force | Guidelines on the environmental efficiency of machine learning processes in supply chain management |
| [L Suppl. 43](http://handle.itu.int/11.1002/1000/14762) | 2021-05-20 | In force | Smart energy saving of 5G base stations: Traffic forecasting and strategy optimization of 5G wireless network energy consumption based on artificial intelligence and other emerging technologies |
| [L Suppl. 44](http://handle.itu.int/11.1002/1000/14763) | 2021-05-20 | In force | Guidelines on best practices and environment friendly policies for effective information and communication technology deployment methods |
| [L Suppl. 45](http://handle.itu.int/11.1002/1000/14883) | 2021-12-10 | In force | Radio base station site best practices |
| [L Suppl. 46](http://handle.itu.int/11.1002/1000/14884) | 2021-12-10 | In force | Definitions and Recent Trends in Circular Cities |

TABLE 12 **Study Group 5 – Technical Reports**

| **Technical Report** | **Date** | **Status** | **Title** |
| --- | --- | --- | --- |
| [LSTR.5GEE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14151) | *24.05.2017* | *In force* | *Study on methods and metrics to evaluate energy efficiency for future 5G systems* |

ANNEX 2

Proposed updates to the Study Group 5 mandate and Lead Study Group roles

**(WTSA Resolution 2 (Rev. Geneva, 2022))**

The following are the proposed changes to the Study Group 5 mandate and Lead Study Group roles agreed at the last Study Group 5 meeting in this study period, based on the relevant portions of WTSA Resolution 2 (Rev. Geneva, 2022).

Annex A
(to Resolution 2 (Rev. Geneva, 2022))

Part 1 – General areas of study

**ITU‑T Study Group 5**

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

ITU‑T Study Group 5 is responsible for the development of standards on the environmental aspects of ICT and digital technologies and the protection of environment including electromagnetic phenomena and climate change.

Study Group 5 will study how the digital transformation can be shaped to ensure it supports transitions towards more sustainable societies.

Study Group 5 will also study issues related to resistibility, human exposure to electromagnetic fields, circular economy, energy efficiency and climate‑change adaptation and mitigation. SG5 will develop international standards, guidelines, technical papers and assessment frameworks that support the sustainable use and deployment of ICTs and digital technologies, and evaluate the environmental performance, including biodiversity, of digital technologies such as, but not limited to, 5G, artificial intelligence, smart manufacturing, automation, etc.

SG5 is also responsible for studying design methodologies and frameworks to reduce the volume and adverse environmental effects of e-waste and to support the transition towards a circular economy.

SG5 has an extended role in evaluating the impact of ICTs in accelerating climate change adaptation and mitigation actions, particularly in industries (including the ICT sector), cities, rural areas and communities. To this end, SG5 is also working to develop standards and guidelines for building resilient ICT infrastructures in rural areas and communities as well as to develop assessment methodologies for the trajectories of the ICT sector with the United Nations Sustainable Development Agenda 2030 and the Paris Agreement.

In addition to its climate-focused activities, SG5 has five other objectives. The first is to protect ICT (including telecommunication equipment and installations) against damage and malfunction due to electromagnetic phenomena, such as lightning as well as from particle radiations. In this field, SG5 is one of the world's most experienced and respected standardization bodies.

The second is to ensure safety of personnel and users of networks against electrical hazards existing in ICT networks. The third is to avoid health risks from electromagnetic fields (EMFs) produced by telecommunication devices and installations. SG5 will develop standards to give operators, manufacturers, and government agencies the tools required to assess EMF levels and to verify compliance with the World Health Organization (WHO) recommended human exposure guidelines and limits. The fourth is to guarantee a good reliability and low latency for high-speed networks services by providing requirements on resistibility and EMC. The fifth is EMC which is another key component of SG5’s work by ensuring that the functionality of telecommunication equipment is not compromised by electromagnetic interference related to radiated and conducted disturbances emitted by other electrical or communications systems. EMC is becoming particularly relevant in accounting for the convergence of telecommunication and IT equipment, as well as in ensuring the efficient operation of home networks.

Study Group 5 is responsible for studies on how to use ICTs and digital technologies to tackle environmental challenges in line with the Sustainable Development Goals (SDGs).

Part 2 – Lead ITU‑T study groups in specific areas of study

SG5 Lead study group on electromagnetic compatibility, resistibility, and lightning protection

 Lead study group on soft error caused by particle radiations

 Lead study group on human exposure to electromagnetic fields

Lead study group on circular economy and e‑waste management

 Lead study group on ICTs related to the environment, energy efficiency, clean energy, and sustainable digitalization for climate actions

**Annex B**(to Resolution 2 (Rev. Geneva, 2022)) **Points of guidance to ITU-T study groups for development
of the post-2021 work programme**

**ITU‑T Study Group 5**

ITU‑T Study Group 5 will develop Recommendations, supplements, and other publications to:

**˗** study the environmental performance of ICTs and digital technologies and their effects on climate change, biodiversity, and other environmental impacts;

**˗** accelerate climate change adaptation and mitigation actions through the use of ICTs and other digital technologies;

**˗** study the environmental aspects of ICT and digital technologies, including issues related to electromagnetic fields, electromagnetic compatibility, energy feeding and efficiency, and resistibility;

**˗** play an active role in reducing the volume of e-waste and facilitate its management, in order to enhance the transition to a circular economy;

**˗** study lifecycle and rare-metal recycling approaches for ICT equipment to minimize the environmental and health impact of e‑waste;

**˗** achieve energy efficiency and sustainable clean energy use in ICTs and digital technologies, including, but not limited to, labelling, procurement practices, standardized power supplies/connectors, eco-rating schemes etc.;

**˗** build resilient and sustainable ICT infrastructures in urban and rural areas as well as in cities and communities;

**˗** study the role of ICTs and digital technologies in climate change adaptation and mitigation;

**˗** reduce the volume of e waste and its environmental impacts (including the environmental impact of counterfeit devices;

**˗** study the transition to a circular economy and implementing circular actions in cities;

**˗** study the role of ICTs and digital technologies to achieve Net Zero within the ICT sector and other sectors as well as in cities.

**˗** develop methodologies for assessing the environmental impact of ICT and other digital technologies;

**˗** develop standards and guidelines for using ICTs and other digital technologies in an eco-friendly way and enhancing rare-metal recycling and energy efficiency of ICT, including infrastructures/facilities

**˗** develop standards, guidelines and metrics/KPIs for aligning the environmental performance of the ICT sector and digital technologies with the UN Sustainable Development Agenda 2030 the Paris Agreement and Connect 2030 Agenda;

**˗** develop energy efficiency/performance metrics/KPIs and related measurement methodologies of ICT and digital technologies including infrastructures and facilities;

**˗** develop tools and guidance on proper, effective, and simple communication to reach out the general public on environmental issues including EMF, EMC, resistibility, climate change adaptation and mitigation, etc.;

**˗** study of methodologies for assessing the environmental impact of ICT, both in terms of its own emissions, power usage and the savings created through ICT applications in other industry sectors;

**˗** study of power-feeding methodologies that effectively reduce power consumption and resource usage, increase safety, and increase global standardization for economic gains;

**˗** set up a low-cost sustainable ICT infrastructure to connect the unconnected;

**˗** study how to use ICTs to help countries and the ICT sector to adapt and build resilience to the effects of environmental challenges, including climate change;

**˗** assess the sustainability impact of ICT to promote the Sustainable Development Goals;

**˗** study the protection of ICT networks and equipment from interference, lightning and power faults;

**˗** develop standards related to the assessment of human exposure to electromagnetic fields (EMF) produced by ICT installations and devices;

**˗** develop standards related to safety and implementation aspects related to ICT powering and to powering through networks and sites;

**˗** develop standards related to components and application references for protection of ICT equipment and the telecommunication network;

**˗** develop standards related to electromagnetic compatibility (EMC), particle radiation effects, and assessment of human exposure to electromagnetic fields (EMF) produced by ICT installations and devices, including cellular phones, IoT devices and radio base stations;

**˗** develop standards on the reutilization of the existing copper network outside plant and related indoor installations;

**˗** develop standards to guarantee a good reliability and low latency for high-speed networks services by providing requirements on resistibility and EMC.

The meetings of Study Group 5 and its working parties/Questions should as far as practicable be collocated with other study groups/working parties/Questions involved in the study of environment, circular economy, energy efficiency and climate change to address the Sustainable Development Goals.

**Annex C**(to Resolution 2 (Rev. Geneva, 2022))
 **List of Recommendations under the responsibility of the respective
ITU-T study groups and TSAG in the 2021-2024 study period**

**ITU-T Study Group 5**

ITU-T K-series

ITU-T L.1 − ITU-T L.9, ITU-T L.18 − ITU-T L.24, ITU-T L.32, ITU-T L.33, ITU-T L.71, ITU-T L.75, ITU-T L.76, ITU-T L.1000-series

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