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| itu_logo | World Telecommunication Standardization Assembly (WTSA-16)Hammamet, 25 October - 3 November 2016 | CCITT/ITU-T 60th Anniversary logo |
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| PLENARY MEETING | Revision 1 toDocument 5-E |
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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-16), PART I: GENERAL |

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| **Abstract:** | This contribution contains the report of ITU-T Study Group 5 to WTSA-16 concerning its activities during the 2013-2016 study period. |

TSB NOTE − The report of Study Group 5 to WTSA-16 is presented in the following documents:

Part I: **Revision 1 to** **Document 5** – General

Part II: **Document 6** – Questions proposed for study during the study period 2017-2020

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# 1 Introduction

## 1.1 Responsibilities of Study Group 5

Study Group 5 was entrusted by the World Telecommunications Standardization Assembly (Dubai, 2012) with the study of 19 Questions in the area of ICTs and the environmental aspects of electromagnetic phenomena and climate change. 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), to safety and to health effects connected with electromagnetic fields produced by telecommunication installations and devices, including cellular phones, the existing copper network outside plant and related indoor installations, methodologies for assessing the environmental impact of ICTs, publishing guidelines for using ICTs in an eco‑friendly way, tackling e-waste issues, and energy efficiency of power feeding systems, how to use ICT to help countries and the ICT sector to adapt to the effects of environmental challenges, including climate change, and in identifying the needs for more consistent and standardised eco‑friendly practices for the ICT sector (e.g. labelling, procurement practices, eco-rating schemes for mobile phones).

## 1.2 Management team and meetings held by Study Group 5

Study Group 5 held six Plenary Session and two Working Parties meetings in the study period (see Table 1) under the Chairmanship of Mr Ahmed Zeddam (France), assisted by Vice-Chairmen Mr **Nasser Saleh Al Marzouqi** (United Arab Emirates)**,** Mr Tariq H. Al-Amri (Saudi Arabia), Mr Héctor Carril (Argentina), Mr **Sam Young Chung** (Republic of Korea), Mr **Flavio Cucchietti (italy),** Mr Keith Dickerson (United Kingdom), Ms **Fatoumata Sekou Dicko (Mali),** MrGuy-Michel Kouakou (Côte d’Ivoire), Mr **Josef Opitz (Germany),** Mr Li Xiao (China), Mr **Célio Fonseca Barbosa**, Chairman of Working Party 1/5, Mr **Phillip Havens and** Mr **György Varju**, Vice-Chairmen of WP1/5, Mr Mitsuo Hattori, Chairman of Working Party 2/5, Mr Fryderyk Lewicki and Mr Mike Wood,Vice-Chairmen of Working Party 2/5, Mr Paolo Gemma, Chairman of Working Party 3/5, Mr Jean-Manuel Canet, Mr Yong-Woon Kim and Mr Franz Zichy, Vice-Chairmen of WP3/5.

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 | Geneva, 29 January - 7 February 2013 | COM 5 – R 1  |
| Study Group 5 | Lima, Peru, 2-13 December 2013 | COM 5 – R 2 |
| Working Party 3/5 | Geneva, 19-23 May 2014 | COM 5 – R 3 |
| Working Parties 1/5 and 2/5 | Geneva, 23-29 July 2014 | COM 5 – R 4, R 5 |
| Study Group 5 | Kochi, India, 8-19 December 2014 | COM 5 – R 6 |
| Study Group 5 | Geneva, 12-23 October 2015 | COM 5 – R 7 |
| Study Group 5 | Kuala Lumpur, Malaysia, 20-27 April 2016 | COM 5 – R 8  |
| Study Group 5 | Geneva, 10-14 October 2016  | COM 5 – R 9  |

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

| Dates | Place/Host | Question(s) | Event name |
| --- | --- | --- | --- |
| 2013-05-27to2013-05-31 | Sophia Antipolis, France  | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=31&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0285)][Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=28&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0286)][Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=29&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0308)][Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=30&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0297)] | Joint ITU-T Study Group 5 and ETSI EE Rapporteurs' meeting |
| 2013-07-02 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=63&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0308)] | Q18/5 e-meeting |
| 2013-07-17 | London, United Kingdom/ Telefónica | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=64&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0294)] | Q16/5 Rapporteurs' meeting |
| 2013-08-01 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=70&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0305)] | Q15/5 e-meeting |
| 2013-10-21to2013-10-25 | Italy/Telecom Italia | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=68&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0285)][Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=69&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0294)][Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=65&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0286)][Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=66&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0308)][Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=67&Group=5) [[report](http://www.itu.int/md/T13-SG05-131202-TD-GEN-0297)] | Multiple SG5 Rapporteurs' meetings |
| 2014-01-16 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=298&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0515)] | Q15/5 discussions |
| 2014-01-21 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=301&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0506)] | Q16/5 discussions |
| 2014-01-22 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=289&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0523)] | Q14/5 discussions |
| 2014-01-31 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=403&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-02-14 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=306&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0501)] | Q19/5 discussions |
| 2014-02-20 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=404&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0515)] | Q15/5 discussions |
| 2014-02-25 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=302&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0506)] | Q16/5 discussions |
| 2014-02-27 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=419&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0515)] | Q15/5 discussions |
| 2014-02-27 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=420&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-03-03 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=421&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-03-12 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=305&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2014-03-13 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=299&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0515)] | Q15/5 discussions |
| 2014-03-14 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=307&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0501)] | Q19/5 discussions |
| 2014-03-17 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=422&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-03-18 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=303&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0506)] | Q16/5 discussions |
| 2014-03-19 | Munich, Germany/NSN | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=407&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 Rapporteurs' meeting |
| 2014-03-19 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=295&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0513)] | Q13/5 discussions |
| 2014-03-24to2014-03-25 | Geneva, Switzerland/ITU | [Q7/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=294&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0792)] | Q7/5 discussions |
| 2014-03-24to2014-03-26 | Madrid, Spain/Telefónica | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=411&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0505)] | Q16/5 Rapporteurs' meeting |
| 2014-03-25to2014-03-27 | Madrid, Spain/Telefónica | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=410&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 Rapporteurs' meeting |
| 2014-04-07 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=488&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-04-09 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=507&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-04-15 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=308&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0501)] | Q19/5 discussions |
| 2014-04-16 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=508&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-04-23 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=568&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-04-23 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=297&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0523)] | Q14/5 discussions |
| 2014-04-24 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=569&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0512)] | Q18/5 discussions |
| 2014-04-29 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=304&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0504)] | Q16/5 discussions |
| 2014-05-08 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=300&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0515)] | Q15/5 discussions |
| 2014-05-15to2014-05-16 | Geneva, Switzerland/ITU | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=423&Group=5) [[report](http://www.itu.int/md/T13-SG05-140519-TD-GEN-0513)] | Q13/5 Rapporteurs' meeting |
| 2014-05-26to2014-05-29 | Budapest, Hungary/Budapest University of Technology and Economics (BME) | [Q3/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=409&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0852)] | Q3/5 Rapporteurs' meeting |
| 2014-06-16 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=589&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 together with ETSI EE discussions |
| 2014-06-25 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=577&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0755)] | Q13/5 discussions |
| 2014-06-26 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=610&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-06-30 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=599&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-07-01 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=593&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 discussions |
| 2014-07-01 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=587&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0757)] | Q16/5 discussions |
| 2014-07-04 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=598&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 together with ETSI EE discussions |
| 2014-07-07 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=609&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 together with ETSI EE discussions |
| 2014-07-08 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=590&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2014-07-22 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=616&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-07-23 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=618&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2014-07-31 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=583&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-07-31 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=588&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0757)] | Q16/5 discussions |
| 2014-08-21 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=687&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-08-26 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=666&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 together with ETSI EE discussions |
| 2014-08-27 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=594&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 discussions |
| 2014-08-28 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=595&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 together with ETSI EE discussions |
| 2014-09-04 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=688&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-09-11 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=578&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0755)] | Q13/5 discussions |
| 2014-09-12 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=729&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-09-15 | Sophia Antipolis, France/ETSI | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=728&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 Rapporteurs' meeting |
| 2014-09-16 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=591&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2014-09-17 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=689&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-09-16to2014-09-17 | Sophia Antipolis, France/ETSI | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=726&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 Rapporteurs' meeting in conjunction with ETSI DES/EE-EEPS 00005 Networks metrics |
| 2014-09-18 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=584&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-09-16to2014-09-18 | Dallas, United States/AT&T | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=621&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0757)] | Q16/5 Rapporteurs' meeting |
| 2014-09-15to2014-09-18 | Sophia Antipolis, France/ETSI | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=727&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 Rapporteurs' meeting in conjunction with ES 203 199 |
| 2014-09-29 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=581&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0819)] | Q14/5 discussions |
| 2014-10-08 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=736&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0760)] | Q19/5 discussions |
| 2014-10-08to2014-10-09 | Brussels, Belgium/European Commission | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=592&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 Rapporteurs' meeting |
| 2014-10-15 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=579&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0755)] | Q13/5 discussions |
| 2014-10-16 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=585&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-10-17 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=740&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0755)] | Q13/5 discussions |
| 2014-10-20 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=741&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0829)] | Q13/5 discussions |
| 2014-10-22 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=784&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-10-23 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=744&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0801)] | Q16/5 discussions |
| 2014-10-29 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=738&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2014-10-30 | E-Meeting | [Q7/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=787&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0792)] | Q7/5 discussions |
| 2014-11-05 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=788&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0801)] | Q16/5 discussions |
| 2014-11-07 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=797&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-11-14 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=798&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0759)] | Q18/5 discussions |
| 2014-11-14 | E-Meeting | [Q6/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=806&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0830)] | Q6/5 discussions |
| 2014-11-14 | E-Meeting | [Q8/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=667&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0839)] | Q8/5 discussions |
| 2014-11-17 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=582&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0819)] | Q14/5 discussions |
| 2014-11-20 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=586&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0756)] | Q15/5 discussions |
| 2014-11-21 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=796&Group=5) [[report](http://www.itu.int/md/T13-SG05-141208-TD-GEN-0758)] | Q17/5 discussions |
| 2015-01-13to2015-01-15 | United Kingdom/BlackBerry Ltd. | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=811&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-01_Rapporteurs-meeting/ID%20108%20-%20Draft%20Minutes%20London.docx)] | Q16/5 Rapporteurs' meeting |
| 2015-02-03 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=910&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-02-03_e-meeting/Minutes%20e-%20meeting%203rd%20of%20February%202015.docx)] | Q15/5 discussions |
| 2015-02-11 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=915&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2015-02-11_e-meeting/ID04-Q17-report-of-e-meeting-11-Feb-2015.docx)] | Q17/5 discussions |
| 2015-02-13 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=919&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2015-02-13_e-meeting/ID03-Q19-report-of-joint-ITU-ETSI-emeeting-13Feb2015.docx)] | Q19/5 discussions |
| 2015-02-25 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=911&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-02-25_e-meeting/Minutes%20e-%20meeting%2025th%20of%20February.docx)] | Q15/5 discussions |
| 2015-03-17 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=916&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2015-03-17_e-meeting/ID04-Q17-report-of-e-meeting-17-March-2015.docx)] | Q17/5 discussions |
| 2015-03-17 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=962&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-03-17_e-meeting/Minutes%20e-%20meeting%2017th%20of%20March.docx)] | Q15/5 discussions |
| 2015-03-18 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=912&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-03-18_e-meeting/Minutes%20e-%20meeting%2018th%20of%20March.docx)] | Q15/5 discussions |
| 2015-03-23 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=931&Group=5) [[report](http://www.itu.int/md/T13-SG05-151012-TD-GEN-1099/en)] | Q13/5 discussions |
| 2015-03-24 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=923&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-03-24_e-meeting/ID113%20-%20Draft%20minutes%2024March2015.docx)] | Q16/5 discussions |
| 2015-04-14 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=917&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2015-04-14_e-meeting/ID04-Q17-report-of-e-meeting-14-April-2015.docx)] | Q17/5 discussions |
| 2015-04-16 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=921&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2015-04-16_e-meeting/ID05%20Q19%20report%20of%20joint%20ITU-ETSI%20emeeting%2016April%202015.docx)] | Q19/5 discussions |
| 2015-04-21 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=924&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-04-21_e-meeting/ID118%20-%20Draft%20minutes%2021April2015.docx)] | Q16/5 discussions |
| 2015-04-22 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=913&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-04-22_e-meeting/ID-01-Report%20of%20Q15%20-%20online%20meeting%2022th%20of%20April%202015.docx)] | Q15/5 discussions |
| 2015-04-23 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=928&Group=5) [[report](http://www.itu.int/md/T13-SG05-151012-TD-GEN-0996)] | Q14/5 discussions |
| 2015-04-22to2015-04-24 | Stockholm, Sweden/Ericsson | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=936&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q18/2015-04-22to24-Stockholm/ID01-Stockholm-report-April-2015.docx)] | Q18/5 Rapporteurs' meeting |
| 2015-05-05 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=925&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-05-05_e-meeting/ID122%20-%20Draft%20minutes%205May2015.docx)] | Q16/5 discussions |
| 2015-05-06 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=914&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-05-06_e-meeting/ID-01-Report%20of%20Q15%20-%20online%20meeting%206th%20of%20May%202015.docx)]  | Q15/5 discussions |
| 2015-05-07 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=929&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q14/2015-05-07_e-meeting/T13-SG05-Draft-Minutes-of-the-Q14-e-meeting-held-on-7-May-2015.docx)] | Q14/5 discussions |
| 2015-05-06to2015-05-07 | Abu Dhabi, United Arab Emirates/Telecommunications Regulatory Authority of the United Arab Emirates | [Q20/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1009&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/plen/q20/2015-05_rapporteur-meeting/ID-010-summary-Q20-7-May-2015.docx)] | Q20/5 Rapporteurs' meeting |
| 2015-05-15 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=922&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2015-05-15_e-meeting/ID04%20Q19%20report%20of%20joint%20ITU-ETSI%20emeeting%2015%20May%202015.docx)] | Q19/5 discussions |
| 2015-05-27 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1058&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-05-27_e-meeting/ID-01-Report%20of%20Q15-online%20meeting-27th%20of%20May%202015.docx)] | Q15/5 discussions |
| 2015-06-08to2015-06-12 | Sophia Antipolis, France/ETSI | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1004&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q13/2015-06-Joint-ETSI/ID-008-meeting_report%20Q13_5-WP3-June2015-Sophia-Antipolis_rev2.docx)][Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1005&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q14/2015-06-Joint-ETSI/ID007-WP3-Q14-June2015-Sophia-Antipolis_final.docx)][Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1006&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q15/2015-06-Joint-ETSI/ID-007-Report-Q155-version-10062015.docx)][Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1007&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q16/2015-06-Joint-ETSI/ID128-Draft-Minutes-Sophia-June2015.docx)][Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1001&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q17/2015-06-Joint-ETSI/ID008-Q17-report-of-rapporteur%20meeting%20and%20joint%20Q17%20-%20EE2%20meeting-%288-12%29-June-2015.docx)][Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1002&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q18/2015-06-Joint-ETSI/ID007-draft-Question-report.docx)][Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1003&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/Joint-ETSI/2015-06/q19/2015-06-Joint-ETSI/ID007-Q19-LDCmarking-early-draft-from-Sophia8-12th%20June-joint-meeting.doc)] | Rapporteurs' meeting in conjunction with ETSI EE |
| 2015-06-15to2015-06-19 | Geneva, Switzerland/ITU | [Q2/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=994&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp1/Joint-Rapp-Mtg-June-2015/q2/2015-06-rapp-meeting/ID-016-Q2-was-ID-2016-Q2-2015R1-06-Rapporteurs-Meeting-Report.doc)][Q3/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=993&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp1/Joint-Rapp-Mtg-June-2015/q3/2015-06-rapp-meeting/ID-005-Q3-Report.docx)][Q4/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=991&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp1/Joint-Rapp-Mtg-June-2015/q4/2015-06-rapp-meeting/ID-0012-Q4-Succinct-meeting-notes-for-June-15-week.docx)][Q5/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=992&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp1/Joint-Rapp-Mtg-June-2015/q5/2015-06-rapp-meeting/ID-006-report-Q5-June2015-Geneva.docx)][Q6/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=995&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q6/2015-06-rapp-meeting/ID-09-report-Q6-June2015-Geneva.docx)][Q7/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=996&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q7/2015-06-rapp-meeting/ID-08rev1-Meeting-report-of-Q7_2015.doc)][Q8/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=997&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q8/2015-06-rapp-meeting/ID-08rev2.docx)][Q9/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=998&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q9/2015-06-rapp-meeting/ID-07rev1-report-Q9-June2015-Geneva.docx)][Q10/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=999&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q10/2015-06-rapp-meeting/ID-03-Meeting-Report_Q10.docx)][Q11/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1000&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp2/Joint-Rapp-Mtg-June-2015/q11/2015-06-rapp-meeting/ID-05rev1-WP2-June2015-Geneva-report-of-q11.doc)] | Rapporteurs' meeting of Q2, 3, 4, 5, 6, 7, 8, 9, 10 and 11/5 |
| 2015-07-08 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1181&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-07-08_e-meeting/ID001-Meeting-report-July-2015.docx)] | Q15/5 discussions |
| 2015-07-08 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1231&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-07-08_e-meeting/ID134%20-%20Draft%20Minutes.docx)] | Q16/5 discussions |
| 2015-07-29 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1232&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-07-29_e-meeting/ID139%20-%20Draft%20Minutes.docx)] | Q16/5 discussions |
| 2015-08-05 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1182&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-08-05_e-meeting/ID001-Meeting%20minutes%20August%202015.docx)] | Q15/5 discussions |
| 2015-08-11 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1159&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2015-08-11_e-meeting/ID03r1-Q17-report-of-e-meeting-11-August-2015.docx)] | Q17/5 discussions |
| 2015-08-24 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1300&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2015-08-24_e-meeting/ID005%20Q19%20report%20of%20joint%20ITU-ETSI%20emeeting%20%20of%2024%20August%202015.docx)] | Q19/5 discussions |
| 2015-08-28 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2318&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2015-08-28_e-meeting/ID-05-ITU-T-Q13-IEC-TC100-%2828%20August%202015%29-meeting%20report.docx)] | Q13/5 discussions |
| 2015-09-09 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1184&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-09-09_e-meeting/ID03-Meeting-minutes-September-2015.docx)] | Q15/5 discussions |
| 2015-09-11 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2319&Group=5) [[report](http://www.itu.int/md/T13-SG05-151012-TD-GEN-1099/en)] | Q13/5 discussions |
| 2015-09-15 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1160&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2015-09-15_e-meeting/ID08-Q17-report-of-e-meeting-15-September-2015.docx)] | Q17/5 discussions |
| 2015-09-16 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2321&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q18/2015-09-16_e-meeting/Emeeting%2C%20September%2016%2C%202015%20Q18-5%20ID002%20Rapporteur%20Minutes%20of%20e-meeting.docx)] | Q18/5 discussions |
| 2015-09-18 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2320&Group=5) [[report](http://www.itu.int/md/T13-SG05-151012-TD-GEN-1099/en)] | Q13/5 discussions |
| 2015-09-22 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1278&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-09-22_e-meeting/ID143-Draft-Minutes.docx)] | Q16/5 discussions |
| 2015-09-28 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1301&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2015-09-28_e-meeting/ID003%20Q19%20report%20of%20joint%20ITU-ETSI%20GTM%2028%20Sept%202015.docx)] | Q19/5 discussions |
| 2015-10-07 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=1186&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-10-07_e-meeting/ID-001-Meeting-report-October2015.docx)] | Q15/5 discussions |
| 2015-11-04 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2360&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1787%22%20%5Co%20%22See%20meeting%20report)] | Q18/5 discussions |
| 2015-11-19 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2347&Group=5) [report] | Q15/5 discussions |
| 2015-11-25 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3508&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2015-11-25_e-meeting/Notes_e-meeting_1_25_November_2015.docx)] | Q13/5 discussions |
| 2015-12-09 | E-Meeting | [Q14/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2344&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q14/2015-12-09_e-meeting/WD-002-9Dec15-Meeting-record.doc)] | Q14/5 discussions |
| 2015-12-16 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2396&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2015-12-16_e-meeting/ID145-Draft-Minutes.docx)] | Q16/5 discussions |
| 2015-12-17 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2348&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2015-12-17_e-meeting/Minutes_Q155_online_meeting_on_the_17th_of_December_2015_WD01.docx)] | Q15/5 discussions |
| 2015-12-21 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3509&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2015-12-21_e-meeting/Notes_e-meeting_2_%2021-December-2015.docx)] | Q13/5 discussions |
| 2016-01-12 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2355&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-01-12_e-meeting/ID04-Q17-report-of-e-meeting-12-January-2016.docx)] | Q17/5 discussions |
| 2016-01-22 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2363&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2016-01-22_e-meeting/ID004%20report%20of%20joint%20Q19-EE2%20GTM%20%2022jan2016.docx)] | Q19/5 discussions |
| 2016-01-25 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2453&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-01-25_e-meeting/Notes_e-meeting_3_%2025-January-2016.docx)] | Q13/5 discussions |
| 2016-02-11 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2433&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2016-02-11_e-meeting/ID148%20-%20Draft%20Minutes.docx)] | Q16/5 discussions |
| 2016-02-15 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2457&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1786%22%20%5Co%20%22See%20meeting%20report)] | Q18/5 discussions |
| 2016-02-17 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3510&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-02-17_e-meeting/Notes_e-meeting_4_%2017_February_2016.docx)] | Q13/5 discussions |
| 2016-02-18 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2372&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2016-02-18_e-meeting/Minutes_Q155_online_meeting_on%20_the_18th_of_February_2016_WD01.docx)] | Q15/5 discussions |
| 2016-02-26 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2364&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2016-02-26_e-meeting/ID005_report_of_joint_Q19-EE2_GTM%20_26feb2016.docx)] | Q19/5 discussions |
| 2016-03-01 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2439&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-03-01_e-meeting/ID03-Q17-report-of-e-meeting-1-March-2016.docx)] | Q17/5 discussions |
| 2016-03-17 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2350&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q15/2016-03-17_e-meeting/Minutes_Q155_online_meeting_on_the_17th_of_March_2016_WD01-Rev.1.docx)] | Q15/5 discussions |
| 2016-03-17 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3550&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-03-17_e-meeting/Notes-e-meeting-17-03-2016.docx)] | Q13/5 discussions |
| 2016-03-22 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=2357&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-03-22_e-meeting/ID03-Q17-report-of-e-meeting-22-March-2016.docx)] | Q17/5 discussions |
| 2016-03-30 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3512&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2016-03-30_e-meeting/ID153%20-%20Draft%20Minutes.docx)] | Q16/5 discussions |
| 2016-03-31 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3555&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-03-31_e-meeting/ID03r1-Q17-report-of-e-meeting-31-March-2016.docx)] | Q17/5 discussions |
| 2016-04-01 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3556&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2016-04-01_e-meeting/ID005r1%20report%20of%20joint%20Q19-EE2%20GTM%20%201%20April%202016.docx)] | Q19/5 discussions |
| 2016-04-05 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3551&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-04-05_e-meeting/ID03-Q17-report-of-e-meeting-5-April-2016.docx)] | Q17/5 discussions |
| 2016-04-06 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=3546&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-04-06_e-meeting/Notes_e-meeting-6-April-2016.docx)] | Q13/5 discussions |
| 2016-05-11 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4577&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-05-11_e-meeting/notes-e-meeting-Circular%20Economy_11-05-16.docx)] | Q13/5 discussions |
|  |  |  |  |
| 2016-05-26 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4580&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1624%22%20%5Co%20%22See%20meeting%20report)] | Q15/5 discussions |
| 2016-06-09 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4590&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2016-06-09_e-meeting/ID158%20-%20Draft%20Minutes.docx)] | Q16/5 discussions |
| 2016-06-15 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4592&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-06-15_e-meeting/notes-e-meeting-Circular_Economy_15-06-16.docx)] | Q13/5 discussions |
| 2016-06-16 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4597&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1625%22%20%5Co%20%22See%20meeting%20report)] | Q15/5 discussions |
| 2016-06-29 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4627&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-06-29_e-meeting/notes-e-meeting-Circular%20Economy_29-06-16.docx)] | Q13/5 discussions |
| 2016-07-05 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4603&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q19/2016-07-05_e-meeting/ID007-report-of-joint-Q19-EE2-emeeting-5July2016.docx)] | Q19/5 discussions |
| 2016-07-12 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4601&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q17/2016-07-12_e-meeting/ID06-Q17-report-of-e-meeting-12-July-2016.docx)] | Q17/5 discussions |
| 2016-07-13 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4638&Group=5) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-07-13_e-meeting/Meeting_notes_e-meeting__13-07__Circular_Economy.docx)] | Q13/5 discussions |
| 2016-08-03 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4647&Group=5" \o "To discuss the comments received during the LC period on  Draft Recommendation ITU-T L.1002) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-08-03_e-meeting/meeting_result.zip%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
|  |  |  |  |
| 2016-08-18 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4649&Group=5" \o "Discussion on e-waste supplements) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1647%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-08-18 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4599&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1626%22%20%5Co%20%22See%20meeting%20report)] | Q15/5 discussions |
|  |  |  |  |
|  |  |  |  |
| 2016-08-22to2016-08-23 | Finland | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4645&Group=5" \o "Drafting the (final?) TR for Circular Economy before EE#50) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1648%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-08-25 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4646&Group=5" \o "Joint WI ETSI/ITU-T on L.mnee) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1636%22%20%5Co%20%22See%20meeting%20report)] | Joint WI ETSI/ITU-T |
| 2016-08-29 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4671&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1630%22%20%5Co%20%22See%20meeting%20report)] | Q19/5 discussions |
| 2016-08-29 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4650&Group=5" \o "E-waste supplement) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1649%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-09-02 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4677&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1637%22%20%5Co%20%22See%20meeting%20report)] | Q17/5 discussions |
| 2016-09-05 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4651&Group=5" \o "Supplement on E-waste) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q13/2016-09-05_e-meeting/IDxxx%20-%20Draft%20Minutes%20e-meeting%20Q13%205th%20september%202016.docx%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-09-05to2016-09-06 | Italy [Turin] | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4680&Group=5" \o "Circular Economy) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1650%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-09-09 | E-Meeting | [Q18/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4694&Group=5" \o "Comments on Draft Recommendation L.1603) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1785%22%20%5Co%20%22See%20meeting%20report)] | Q18/5 discussions |
| 2016-09-12 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4676&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1638%22%20%5Co%20%22See%20meeting%20report)] | Q17/5 discussions |
| 2016-09-12 | E-Meeting | [Q16/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4670&Group=5" \o "Click here for more details) [[report](https://www.itu.int/ifa/t/2013/sg5/exchange/wp3/q16/2016-09-12_e-meeting/ID161%20-%20Draft%20Minutes.docx%22%20%5Co%20%22See%20meeting%20report)] | Q16/5 discussions |
| 2016-09-13 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4599&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1631%22%20%5Co%20%22See%20meeting%20report)] | Q19/5 discussions |
| 2016-09-13 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4696&Group=5" \o "Circular Economy) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1652%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-09-13 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4673&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1627%22%20%5Co%20%22See%20meeting%20report)] | Q15/5 discussions |
| 2016-09-13 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4697&Group=5" \o "Discussion on L.1350) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1639%22%20%5Co%20%22See%20meeting%20report)] | Q17/5 discussions |
| 2016-09-14 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4602&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1640%22%20%5Co%20%22See%20meeting%20report)] | Q17/5 discussions |
|  |  |  |  |
| 2016-09-15 | E-Meeting | [Q15/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4600&Group=5) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1628%22%20%5Co%20%22See%20meeting%20report)] | Q15/5 discussions |
| 2016-09-21 | E-Meeting | [Q13/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=4695&Group=5" \o "Supplement on \“Assessment of quantity of E-waste in developing countries\” (Suppl._EWQ) and Supplement  on \“Collection of sustainable models for e-waste management by private corporations (Suppl._L.BM)) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1653%22%20%5Co%20%22See%20meeting%20report)] | Q13/5 discussions |
| 2016-09-27 | E-Meeting | [Q17/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=5700&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1641%22%20%5Co%20%22See%20meeting%20report)] | Q17/5 discussions |
| 2016-09-27 | E-Meeting | [Q19/5](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=5697&Group=5" \o "Click here for more details) [[report](http://www.itu.int/md/T13-SG05-161010-TD-GEN-1632%22%20%5Co%20%22See%20meeting%20report)] | Q19/5 discussions |

# 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 three working parties.

During the study period, a Focus Group was created to study Smart Sustainable Cities (FG-SSC) and another on Smart Water Management (FG-SWM).

A Joint Coordination Activity on ICTs and Climate Change (JCA-ICT&CC) was established in April 2009 following the successful completion of the work of the Focus Group on ICT and Climate Change.

**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 WTSA-12 Resolution 54, the following Regional Groups were created: Study Group 5 Regional Group for the Americas (SG5 RG-AMR) and Study Group 5 Regional Group for Asia and the Pacific (SG5 RG-AP).

TABLE 2
Organization of Study Group 5

| Designation | Questions to be studied | Title of the Working Party | Chairmanand Vice-Chairmen |
| --- | --- | --- | --- |
| PLENARY | Q12/5Q20/5 (deleted) | Guides and terminology on environment and climate changeSmart Sustainable Cities and Communities (SSCC) | Mr Michael Maytum (Rapporteur)Mr Paolo Gemma (Acting Rapporteur until October 2015) |
| WP 1/5 | Q1/5 (deleted); Q2/5; Q3/5; Q4/5; Q5/5 | Damage prevention and safety | Mr Célio Fonseca Barbosa (Chairman)Mr Phillip Havens (Vice-chairman)Mr György Varju (Vice-chairman) |
| WP 2/5 | Q6/5; Q7/5; Q8/5; Q9/5; Q10/5; Q11/5 | Electromagnetic fields: emission, immunity and human exposure | Mr Mitsuo Hattori (Chairman)Mr Fryderyk Lewicki (Vice-chairman)Mr Mike Wood (Vice-chairman) |
| WP 3/5 | Q13/5; Q14/5; Q15/5; Q16/5; Q17/5; Q18/5; Q19/5 | ICT and climate change | Mr Paolo Gemma (Chairman)Mr Jean-Manuel Canet (Vice-chairman)Mr Yong-Woon Kim (Vice-chairman)Mr Franz Zichy (Vice-chairman) |

TABLE 3
Other Groups (if any)

| Title of the Group | Chairman | Vice-Chairmen |
| --- | --- | --- |
| Study Group 5 Regional Group for the Americas (SG5 RG-AMR) | Mr Héctor Mario Carril | Mr Oscar León\*, Mr Agostinho Linhares de Souza Filho |
| Study Group 5 Regional Group for Asia and the Pacific (SG5 RG-AP) | Mr Li Xiao | Mr Sam Young Chung, Mr Takafumi Hashitani |
| Focus Group on Smart Sustainable Cities (FG-SSC) | Ms Silvia Guzmán Araña | Mr Flavio Cucchietti, Mr Pablo Bilbao, Mr Franz Zichy, Mr Nasser Saleh Al Marzouqi, Mr Ziqin Sang,Mr Sekhar Kondepudi |
| Focus Group on Smart Water Management (FG-SWM) | Mr Ramy Ahmed Fathy | Ms Helen Nakiguli, Mr Jorge Grandi, Mr Ick Hwan Ko, Mr Robert Hope, Mr Michael E. Sullivan, Mr Khaled M. AbuZeid, Mr Ziqin Sang, Mr Waleed K. AlZubari |

\* Until August 2015, as he was then appointed as Executive Secretary of CITEL in August 2015.

## 2.2 Questions and Rapporteurs

**2.2.1** WTSA-12 assigned to Study Group 5 the 19 Questions listed in Table 4.

**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 4
Study Group 5 – Questions assigned by WTSA-12 and Rapporteurs

| Questions | Title of the Questions | WP | Rapporteur |
| --- | --- | --- | --- |
| 1/5 | Copper cables, networks and fibre-optic connection hardware for broadband access | 1/5 | Mr Zander B.Araujo(Rapporteur until 12/2014) |
| 2/5 | Protective components and assemblies | 1/5 | Mr Michael Maytum (Rapporteur)Mr Kazuo Murakawa (Associate rapporteuruntil 07/2014)Ms Tatjana Gazivoda-Nikolic, (Associate rapporteur from 12/2014)Mr Ben Huang (Associate rapporteur) |
| 3/5 | Interference to telecommunication networks due to power systems and electrified railway systems | 1/5 | Mr Jean-Luc Garcia (Rapporteur)Mr György Varju (Associate rapporteur)Mr Livio Zucchelli (Associate rapporteuruntil 10/2015) |
| 4/5 | Resistibility and safety in telecommunications | 1/5 | Mr Phillip Havens (Rapporteur)Sylvain Person (Associate rapporteur until 07/2014)Kristiaan Carpentier (Associate rapporteur until 10/2015) |
| 5/5 | Lightning protection and earthing of telecommunication systems | 1/5 | Mr Ying Xiong (Rapporteuruntil 10/2015)Mr Chuanyou Dai (Rapporteurfrom 10/2015)Mr Zafiris Politis (Associate rapporteur)Mr Huagang Wang (Associate rapporteur) |
| 6/5 | EMC issues arising from the convergence of IT and communication equipment | 2/5 | Mr Fantao Meng (Rapporteur)Mr Bojun Zhang (Associate rapporteur) |
| 7/5 | Human exposure to electromagnetic fields (EMFs) due to radio systems and mobile equipment | 2/5 | Mr Fryderyk Lewicki (Rapporteur)Mr Tariq Al-Amri (Associate rapporteur)Mr Mike Wood (Associate rapporteur)Mr Jafar Keshvari (Associate rapporteur from 12/2013 to 10/2015) |
| 8/5 | EMC issues in home networks | 2/5 | Mr Ryuichi Kobayashi (Rapporteur)Mr Kazuhiro Takaya (Associate rapporteur from 04/2016)Ms Xia Zhang (Associate rapporteur) |
| 9/5 | Generic and product family EMC recommendations for telecommunication equipment | 2/5 | Mr Xing Hai Zhang (Rapporteur)Mr Fantao Meng (Associate rapporteur) |
| 10/5 | Security of telecommunication and information systems concerning the electromagnetic environment | 2/5 | Mr Tetsuya Tominaga (Rapporteur)Mr Hidenori Iwashita (Associate rapporteurfrom 04/2016)Mr Yuichiro Okugawa (Associate rapporteur) |
| 11/5 | EMC requirements for the information society | 2/5 | Mr Lin Guo (Rapporteuruntil 12/2014)Ms Xia Zhang (Rapporteurfrom 12/2014)Mr Zhong Yu (Associate rapporteur)Mr Junfei Cao (Associate rapporteur) |
| 12/5 | Guides and terminology on environment and climate change | PLEN | Mr Maytum Michael (Rapporteur)Mr Franz Zichy (Associate rapporteur until 10/2015)Mr Keith Dickerson (Associate rapporteur)Mr Mike Wood (Associate rapporteur) |
| 13/5 | Environmental impact reduction including e-waste | 3/5 | Mr Zia Zhang (Rapporteuruntil 12/2014)Mr Gianluca Griffa (Associate Rapporteur until 12/2014)Ms Marga Blom (Co-rapporteurfrom 04/2016)Mr Peter Ulanga (Co-rapporteur since 04/2016 and Rapporteur until 12/2014Mr Nasser Saleh Al Marzouqi (Associate rapporteur)Ms Anita Batamuliza (Associate rapporteur)Mr Weixiang Guo (Associate rapporteur from 12/2014)Ms Hoda Salah Eldin Shakra (Associate rapporteur from 12/2014) |
| 14/5 | Setting up a low-cost sustainable telecommunication infrastructure for rural communications in developing countries | 3/5 | Mr Franz Zichy (Rapporteuruntil 10/2015)Mr Faulkner Dave (Co-rapporteur)Mr Asit Kadayan (Co-rapporteur from 10/2015)Mr Peter Ulanga (Associate rapporteur) |
| 15/5 | ICTs and adaptation to the effects of climate change | 3/5 | Ms Nevine Mounir Tewfik Loutfi (Rapporteur)Mr Dave Faulkner (Associate rapporteur)Mr Derick Simiyu Khamali (Associate rapporteur)Mr Peter Ulanga (Associate rapporteur from 12/2013) |
| 16/5 | Leveraging and enhancing the ICT environmental sustainability | 3/5 | Mr Gilbert Buty (Rapporteur)Ms Daniela Torres (Associate rapporteur until 12/2014)Mr Flavio Cucchietti (Associate rapporteur)Mr Vincent Urbain Namrona (Associate rapporteur) |
| 17/5 | Energy efficiency for the ICT sector and harmonization of environmental standards | 3/5 | Mr Gianluca Griffa (Rapporteur until12/2014)Ms Shuguang Qi (Rapporteur from 12/2014)Mr Claudio Bianco (Associate rapporteur from 12/2014)Mr Leonid Rabinovich (Associate rapporteur) |
| 18/5 | Methodologies for the assessment of environmental impact of ICT | 3/5 | Mr Jean-Manuel Canet (Rapporteur)Ms Pernilla Bergmark (Associate rapporteur)Mr Takafumi Hashitani (Associate rapporteur) |
| 19/5 | Power feeding systems | 3/5 | Mr Didier Marquet (Rapporteur)Mr Yoshihiro Kondo (Associate rapporteur)Ms Shuguang Qi (Associate rapporteur) |

TABLE 5
Study Group 5 – New Questions adopted and Rapporteurs

| Questions | Title of the Questions | WP | Rapporteur |
| --- | --- | --- | --- |
| Q20/5 | Smart Sustainable Cities and Communities (SSCC) | 3/5 | Mr Paolo Gemma (acting Rapporteur until October 2015) |

TABLE 6
Study Group 5 – Questions deleted

| Questions | Title of Questions | Rapporteurs | Results |
| --- | --- | --- | --- |
| Q1/5 | Copper cables, networks and fibre-optic connection hardware for broadband access | Mr Zander B. Araujo (Rapporteur) |  |
| Q20/5 | Smart Sustainable Cities and Communities (SSCC) | Mr Paolo Gemma (acting Rapporteur) |  |

# 3 Results of the work accomplished during the 2013-2016 study period

## 3.1 General

During the study period, Study Group 5 examined 845 contributions and generated a large number of TDs and liaison statements. It also:

– developed 48 new Recommendations;

– revised 27 existing Recommendations;

– amended eight Recommendations;

– developed two corrigenda and two appendixes;

– deleted one Recommendation;

– developed 42 Supplements;

– developed eight Technical Papers and Tutorial.

– agreed 1 Recommendation for deletion

FG-SSS developed 21 Technical Reports and Specifications and FG-SWM developed 4 Technical Reports.

NOTE − Information to be updated after SG5 meeting due to be held from 10 to 14 October 2016, in Geneva, Switzerland.

## 3.2 Highlights of achievements

The main results achieved on the various Questions assigned to Study Group 5 are briefly summarized below. Formal replies to the Questions are given in a synoptic table in Annex 1 of this report.

a) Question 12/5

During this study period liaison activity took place with the Standardization Committee for Vocabulary (SCV), ITU-T SG2 and TSAG concerning terms and definitions. A training was given in Q12/5 meetings on new or revised A-series Recommendations. Work started on the Web version of the Terminology Handbook outlined in [TD182](http://www.itu.int/md/T13-SG05-130129-TD-GEN-0182/en), but will not be completed in this study period. With the deletion of Q1/5, Q12/5 became responsible for maintenance and enhancement of the existing Q1/5 L-series Recommendations, if needed.

b) Working Party 1/5 achievements

Question 2/5 - Protective components and assemblies

During the study period, Question 2/5 managed to produce new Recommendations for specifications, test methods and principles of application for protective components and assemblies intended to mitigate effects of lightning, power induction, ESD, fast transients and power contacts that may cause permanent damage on ICT equipment. It is worth mentioning that these protective components and assemblies are related to both telecommunication and power supply circuits of telecommunications equipment.

The new Recommendations include ITU-T K.95 “Surge parameters of isolating transformers used in telecommunication devices and equipment”, ITU-T K.96 “Surge protective components: Overview of surge mitigation functions and technologies”, ITU-T K.99 “Surge protective component application guide - Gas discharge tubes”, ITU-T K.102 “Parameters of fixed-voltage thyristor overvoltage protector components used for the protection of telecommunication installations”, and ITU‑T K.103 “Surge protective component application guide - Silicon PN junction components”. Question 2/5 also produced a Supplement K.Suppl.3: ITU-T K.20, K.21, K.45, K.82 on “Additional criteria to protect telecommunication cabling during a power cross event”.

Draft Recommendation ITU-T K.117 “Primary protector parameters for the surge protection of equipment Ethernet ports”was consented in October 2016.

Question 3/5 - Interference to telecommunication networks due to power systems and electrified railway systems

During the study period, Question 3/5 produced new Recommendations and revised existing ones in order to assess and mitigate the influence of power systems and electrical railway systems on telecommunications networks. This influence is characterized by interference on voice and data transmissions, as well as damage to telecommunication plants and equipment due to power line and electrical railway faults.

The new Recommendations developed include ITU-T K.104 “Method for identifying the transfer potential of the earth potential rise from high or medium voltage networks to the earthing system or neutral of low voltage networks”, ITU-T K.107 “Method for determining the impedance to earth of earthing systems”, ITU-T K.108 “Joint use of poles by telecommunication and solidly earthed power lines”, and ITU-T K.109 “Installation of telecommunication equipment on utility poles”. It was also revised Recommendation ITU-T K.57 “Protection measures for radio base stations sited on power line towers”.

Question 4/5 - Resistibility and safety in telecommunications

During the study period, Question 4/5 produced new Recommendations and revised existing ones in order to establish resistibility requirements for equipment installed in telecommunication centres, in the access and trunk networks of outdoor enclosures, and at customer premises. Sources of overvoltages and overcurrents that may cause damage to the equipment include lightning, power induction and main power contacts. The types of interfaces include symmetric pair, coaxial, dedicated power feeds and main power ports.

The new Recommendation related to this question is the comprehensive ITU-T K.98 “Overvoltage protection guide for telecommunication equipment installed in customer premises”, which includes source data for the development of new resistibility Recommendations. The revised Recommendations related to this question include ITU-T K.20 “Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents”, ITU‑T K.21 “Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents”, ITU-T K.44 “Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendation”, ITU-T K.45 “Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents”, ITU-T K.50 “Safe limits of operating voltages and currents for telecommunication systems powered over the network”, ITU-T K.51 “Safety criteria for telecommunication equipment”, ITU-T K.64 “Safe working practices for outside equipment installed in particular environments”, and ITU-T K.75 “Classification of interface for application of standards on resistibility and safety of telecommunication equipment”.

Question 5/5 - Lightning protection and earthing of telecommunication systems

During the study period, Question 5/5 developed new Recommendations and revised existing ones on the protection of telecommunication systems against lightning flashes and the earthing and bonding configurations applied to telecommunication installations (telecommunication buildings, remote electronic sites and customer premises).

The new Recommendations include ITU-T K.97 “Lightning protection of distributed base stations”, ITU-T K.101 “Shielding factors for lightning protection”, ITU-T K.105 “Lightning protection of photovoltaic power supply systems feeding radio base stations”, ITU-T K.110 “Lightning protection of the dedicated transformer for radio base stations”, ITU-T K.111 “Protection of surrounding structures of telecommunication towers against lightning”, and ITU‑T K.112 “Lightning protection, earthing and bonding: practical procedures for radio base stations”. It was also revised Recommendation ITU-T K.67 “Expected surges on telecommunication and signalling networks due to lightning”.

Draft Recommendations ITU-T K. 118 “Requirements for Lightning Protection of Fibre To The distribution point (FTTdp) Equipment”, ITU-T K.119 “Conformance Assessment of Radio Base Stations Regarding Lightning Protection and Earthing” and ITU-T K. 120 “Lightning Protection and Earthing of Miniature Base Station” were consented in October 2016.

c) Working Party 2/5 achievements

Question 6/5 - EMC issues arising from the convergence of IT and communication equipment

During the study period, Question 6/5 revised existing Recommendations on the safe and problem-free operation of broadband systems in unbundled and co-located environments. The Question dealt with sensitive issues on interferences between wired broadband transmission systems and wireless communications.

Q6/5 revised ITU-T K.58 “EMC, resistibility and safety requirements and guidance for determining responsibility under co-located information and communication technology installations”, ITU-T K.59 “Electromagnetic compatibility, resistibility and safety requirements and procedures for connection to unbundled cables” and ITU-T K.60 “Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services”.

Question 7/5 - Human exposure to electromagnetic fields (EMFs) due to radio systems and mobile equipment

During the study period, Question 7/5 developed new Recommendations and revised existing ones on the provision of high level frameworks for managing the human exposure to EMFs (regulatory practices) emitted by the telecommunication equipment and guidelines for the assessment of human exposure based on existing standards and Recommendations.

The new Recommendations include ITU-T K.100 “Measurement of radio frequency electromagnetic fields to determine compliance with human exposure limits when a base station is put into service” and ITU-T K.113 “Generation of radiofrequency electromagnetic field level maps”. It also revised ITU-T K.52 “Guidance on complying with limits for human exposure to electromagnetic fields”.

Q7/5 also revised and introduced a new software supporting assessment of the human exposure (i.e. Appendix V of ITU-T K.70 EMF-estimator, Calculator for equivalent isotropic radiated power as described in Recommendation ITU-T K.52).

Draft Recommendations ITU-T K.121 “Guidance on the Environmental Management for Compliance with Radio Frequency EMF limits for Radiocommunication Base Stations” and ITU-T K. 122 “Exposure levels in the close proximity of the radiocommunication antennas”were consented in October 2016.

It continued implementation of the activity specified in WTSA-16 revised Resolution 72 “Measurement concerns related to human exposure to electromagnetic fields” in order to assist developing countries in human exposure assessment. It conducted activities specified in revised Resolution 176 “Human exposure to and measurement of electromagnetic fields”, (PP, Busan, 2014).

ITU EMF Guide and Mobile Application was produced and translated into the six UN languages. A Malaysian version was made available in April 2016.

Symposiums on human exposure to EMF were held, which disseminated knowledge on EMF exposure.

The studies were carried out in close cooperation with WHO, ICNIRP and IEC TC106.

Question 8/5 - EMC issues in home networks

During the study period, Question 8/5 developed new Recommendations and revised an existing one related to guidelines for the management of EMC, resistibility and safety issues of home networks.

The new Recommendation developed was ITU-T K.106 “Techniques to mitigate interference between radio devices and cable or equipment connected to wired broadband networks and cable television networks”. It revised Recommendation ITU-T K.74 “Electromagnetic compatibility, resistibility and safety requirements for home network devices”.

The study was carried out in close collaboration with ITU-T SG9 and ITU-R.

Question 9/5 - Generic and product family EMC recommendations for telecommunication equipment

During the study period, Question 9/5 developed a new Recommendation on the provision of a proper EMC test method and requirements for telecommunication equipment. It reviewed existing K-series EMC Recommendations to ensure that they remain accurate and relevant for the telecommunications industry and environment. The changes in the environment or in technology (for example the application of new radio systems) were examined to ensure that these documents remain current and valid.

The new Recommendation that was developed is ITU-T K.114 “Electromagnetic compatibility requirements and measurement methods for digital cellular mobile communication base station equipment”.

Draft Recommendation ITU-T K.123 “EMC requirements for electrical systems in telecommunication facilities”was consented in October 2016.

Question 10/5 - Security of telecommunication and information systems concerning the electromagnetic environment

During the study period, Question 10/5 produced new Recommendations and revised existing ones on guidelines to protect key telecommunication centres and ICT equipment from disruption due to electromagnetic effects. This work includes protection from lightning damage, from Electromagnetic Compatibility (EMC) issues and also the effects of High-Altitude Electromagnetic Pulse (HEMP) and High Power Electromagnetic (HPEM) attack and Intentional Electromagnetic Interference (IEMI).

The following new Recommendations were developed by Q10/5: ITU-T K.81 “High-power electromagnetic immunity guide for telecommunication systems” and ITU-T K.115 “Mitigation methods against electromagnetic security threats”. Q10/5 also revised ITU-T K.78 “High altitude electromagnetic pulse immunity guide for telecommunication centres”, ITU-T K.81 “High-power electromagnetic immunity guide for telecommunication systems”, ITU-T K.84 “Test methods and guide against information leaks through unintentional electromagnetic emissions” and ITU-T K.87 “Guide for the application of electromagnetic security requirements – Overview”.

Draft Recommendation ITU-T K.124 “Overview of particle radiation effects on telecommunications systems”  was consented in October 2016.

Supplement K.Suppl.6 to ITU-T K.115 “Measuring shielding effectiveness using normalized site attenuation in free space”was agreed in October 2016.

New work items were established to provide design, test, and mitigation methods regarding “soft error” caused by particle radiations such as neutron rays. The new study has successfully developed the first drafts of three new Recommendations.

Question 11/5 - EMC requirements for the information society

During the study period, Question 11/5 produced a new Recommendation on methodologies for predicting and mitigating EMC problems as a result of the changing electromagnetic environment with respect to both wireless and wireline technologies that are widely used in the exchange of voice and data over telecommunication networks.

The new Recommendation that was developed is ITU-T K.116 “Electromagnetic compatibility requirements and test methods for radio telecommunication terminal equipment”. Q11/5 also revised Recommendation ITU-T K.79 “Electromagnetic characterization of the radiated environment in the 2.4 GHz ISM band”.

d) Working Party 3/5 achievements

Question 13/5 - Environmental impact reduction including e-waste

During the study period, Question 13/5 developed Recommendations for the management and reduction of e-waste with the aim of reducing impact on the environment. A series of new Recommendations have been approved under this Question including ITU-T L.1101 “Measurement methods to characterize rare metals in information and communication technology goods”, ITU-T L.1005 “Test suites for assessment of the universal charger solution” and ITU-T L.1010 “ Green battery solution for mobile phones and other hand-held information and communication technology devices”.

Recommendation ITU-T L.1101 provides reference characterization procedures for efficient recycling of rare metals by using XRF and ICP-MS measurement methods. Recommendation
ITU-T L.1005 considers the creation of specific test suites to assess certain functional aspects of the: energy efficiency, interworking, safety and electromagnetic compatibility (EMC) of the universal charger solution (UCS). Such testing is required to guarantee a minimum quality level of the UCS in conformance with the target basic configuration of the UCS and charger described in Recommendation ITU-T L.1000. Recommendation ITU-T L.1010 defines a minimum set of parameters necessary to identify green battery solutions that should be considered by developers/manufacturers to reduce the future environmental impact of battery use.

The work conducted within Q13/5 also included Supplements to establish a framework of common understanding on e-waste management, involving pertinent stakeholders and building a platform to exchange best practices between the different countries. These Supplements include ITU-T L.Suppl.4 “Guidelines for developing a sustainable e-waste management system”, ITU-T L.Suppl.5 “Life-cycle management of ICT goods”, ITU-T L.Suppl.20 “Green public ICT procurement”, ITU-T L.Suppl.21 “Implementation guidance for ICT SME supply chains due diligence for conflict minerals”, L.Suppl.27: Supplement on success stories on e-waste management and L.Suppl.28: Circular Economy in Information and Communication Technology; Definition of approaches, concepts and metrics.

Recommendation ITU-T L.1002 “External universal power adapter solutions for portable information and communication technology devices” was approved on 14 October 2016. Recommendation ITU-T L.1002 defines requirements, and provides guidelines on environmental aspects, of universal power adapter solutions (UPA) designed for use with portable information and communication technology ICT devices. Recommendation ITU-T L.1102 was approved and describes printed label methods to provide information on rare metals contained in information and communication technology (ICT) goods, and includes requirements specified in Recommendations ITU-T L.1100 and ITU-T L.1101 on the disclosure of rare metals information to consumers and recyclers.

Draft Recommendation ITU-T L.1006 (ex L.test suites stationary) “Test suites for assessment of the External universal power adapter solutions for stationary information and communication technology devices” was consented in October 2016. This Draft Recommendation defines test methods for UPA to demonstrate the compliance with ITU-T Recommendation L.1001.

Draft Recommendation ITU-T L.1007 (ex L.test suites portable) “Test suites for assessment of the External universal power adapter solutions for portable information and communication technology devices” was consented in October 2016. It defines test methods for UPA to demonstrate the compliance with ITU-T Recommendation L.1002.

The concept of circular economy in the ICT sector is also under study within Q13/5.

Question 14/5 - Setting up a low-cost sustainable telecommunication infrastructure for rural communications in developing countries

During the study period, Question 14/5 developed Recommendations on solutions related to low cost sustainable ICT solutions depending on country, environmental and geographic/climatic situation.

Q14/5 approved Recommendation ITU-T L.1700 “Requirements and framework for low-cost sustainable telecommunications infrastructure for rural communications in developing countries”. The objective of this Recommendation is to identify general requirements and frameworks for low-cost sustainable telecommunications infrastructure with a special focus for rural communications in developing countries. Its purpose is to quickly and inclusively bridge the digital divide.

Five new Supplements were agreed: ITU-T L.Suppl.22 “ITU-T L.1700 - Low-cost sustainable telecommunication for rural communications in developing countries using fibre optic cable”, ITU-T L.Suppl.23 “ITU-T L.1700 - Low-cost sustainable telecommunications for rural communications in developing countries using microwave and millimetre radio links”, L.Suppl.29: L.1700 - Supplement on low-cost sustainable telecommunication for rural communications in developing countries using Cellular Radio Technologies, L.Suppl.30: L.1700 - Supplement on setting up a low-cost sustainable telecommunications network for rural communications in developing countries using cellular network with capacity transfer and L.Suppl.31: Supplement on setting up a low-cost sustainable telecommunications network for rural communications in developing countries using satellite systems.

Question 15/5 - ICTs and adaptation to the effects of climate change

During the study period, Question 15/5 developed a Recommendation on how ICT can be leveraged to adapt to climate change in cities, countries and the industrial sector.

Q15/5 developed Recommendations ITU-T L.1500 “Framework for information and communication technologies and adaptation to the effects of climate change”, ITU-T L.1501 “Best practices on how countries can utilize ICTs to adapt to the effects of climate change”, ITU-T L.1502 “Adapting information and communication technology infrastructure to the effects of climate change” and ITU-T L.1503 “Information and communication technologies for climate change adaptation in cities”.

ITU-T L.1500 describes the framework for using ICTs in adaptation to the effects of climate change. ITU-T L.1501 provides guidance on how information and communication technologies (ICTs) can help countries to adapt to the effect of climate change. It also provides a framework and checklist for countries to integrate ICTs in their national climate change adaptation strategies.
ITU-T L.1502 identifies direct and indirect threats of climate change on ICT services and provides options for adaptation and mitigation. These threats include extreme rainfall, flooding, landslides, extreme wind, lightning, extreme humidity, drought, ice storms and heavy snowfall. ITU-T L.1503 identifies the impacts of climate change in cities and explains why cities need to adapt to its harmful effects. Draft Recommendation ITU-T L.1504 (ex. L.ICT and adaptation of agriculture) “ICT and adaptation of agriculture to the effects of climate change” was consented in October 2016. This Draft Recommendation defines requirements and provide description of how the use of ICT can help sustain the agricultural sector in the event of poor yields or disasters triggered by climate change.

In addition, Q15/5 agreed five Supplements: ITU-T L.Suppl.14 “ITU-T L.1500 - Standardization gap analysis for smart water management”, ITU-T L.Suppl.15 “ITU-T L.1500 - Requirements for water sensing and early warning systems”, ITU-T L.Suppl.16 “ITU-T L.1500 - Smart water management in cities”, ITU-T L.Suppl.24: “ITU-T L.1500 - Overview of climate change effects and possible impacts” and ITU-T L.Suppl.25: “ITU-T L.1502 - Best practices for infrastructure adaptation to climate change”.

Q15/5 is also examining how ICTs can help in the adaptation of agriculture to the effects of climate change.

Question 16/5 - Leveraging and enhancing the ICT environmental sustainability

Question 16/5 developed L.Suppl.32: Supplement for eco-specifications and rating criteria for mobile phones eco-rating programs. This Supplement outlines a baseline assessment framework and defines a minimum set of criteria to be considered when assessing the environmental performance of mobile phones. This Supplement is designed to enable manufacturers to assess mobile phones in order to demonstrate a minimum level of environmental performance and also to achieve enhanced environmental performance.

Question 17/5 - Energy efficiency for the ICT sector and harmonization of environmental standards

Question 17/5 developed Recommendations and Supplements on energy efficiency solutions, methodologies and metrics for the ICT sector including on equipment, networks and data centers.

Q17/5 aims to create a common framework of understanding on energy efficiency metrics to establish a common language which will allow for comparing solutions and carrying out cost benefit analysis.

Q17/5 also examines the creation of new energy efficient architectures and monitoring of energy efficiency to improve energy saving and efficiency of ICT including all ICT product solutions, data centers, base stations sites and other facilities.

Q17/5 developed Recommendations ITU-T L.1300 “Best practices for green data centres”, ITU-T L.1301 “Minimum data set and communication interface requirements for data centre energy management”, ITU-T L.1302 “Assessment of energy efficiency on infrastructure in data centres and telecom centres”, ITU-T L.1310 “Energy efficiency metrics and measurement methods for telecommunication equipment”, ITU-T L.1320 “Energy efficiency metrics and measurement for power and cooling equipment for telecommunications and data centres”, ITU-T L.1321 “Reference operational model and interface for improving energy efficiency of ICT network hosts”, ITU-T L.1330 “Energy efficiency measurement and metrics for telecommunication networks”, ITU-T L.1340 “Informative values on the energy efficiency of telecommunication equipment” and ITU-T L.1350 “Energy efficiency metrics of base station site”.

The following Draft Recommendations have been consented in October 2016:

– Draft Recommendation ITU-T L.1360 (ex L.EE-ARCH) “Energy control of SDN architecture”, defines an energy-efficient Software Defined Network general architecture and an energy states model.

– Draft Recommendation ITU-T L.1331 (ex. L.mnee) “Assessment of mobile network energy efficiency”, defines the methodology to assess the energy efficiency of mobile network.

– Draft Recommendation ITU-T L.1315 (ex. L.std tandt in EE) “Standardization terms and trends in energy efficiency” contains definition and base measurement test requirement for energy efficiency and energy management of ICT equipment.

– Draft Recommendation ITU-T L.1325 (ex. L. Green STNI) “Green ICT solutions for telecom network facilities” introduces highly-efficient infrastructure solutions, including highly-efficient power solutions, renewable energy solutions, air-conditioning energy saving solutions and free and economized cooling solutions.

Supplement L.Suppl.33: Assessment of Energy Consumption of ICT Services was agreed in October 2016.

Most of these studies are conducted in collaboration with other relevant entities. ITU-T Study Group 5 is actively exchanging information with other standard development organizations like ETSI, IEC and ATIS on this topic.

Question 18/5 - Methodologies for the assessment of environmental impact of ICT

Within Question 18/5, the development of various methodologies for goods, services and networks has continued.

Q18/5 has developed Recommendations ITU-T L.1430 “Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects”, ITU-T L.1440 “Methodology for environmental impact assessment of information and communication technologies at city level”, ITU-T Y.4900/L.1600 “Overview of key performance indicators in smart sustainable cities”, ITU-T Y.4901/L.1601 “Key performance indicators related to the use of information and communication technology in smart sustainable cities” and ITU-T Y.4902/L.1602 “Key performance indicators related to the sustainability impacts of information and communication technology in smart sustainable cities”.

Recommendation ITU-T Y.4903/L.1603 “Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals” was approved in October 2016.

Q18/5 also revised Recommendation ITU-T L.1410 “Methodology for environmental life cycle assessments of information and communication technology goods, networks and services”. This is the first technically aligned standard developed by ITU-T and ETSI.

A new Supplement L.Suppl.34: Example of hybrid-based LCA of the aggregated second order effects of selected ICT services was agreed in October 2016.

Question 19/5 - Power feeding systems

Question 19/5 focuses on the energy efficiency of the power feeding systems that are used in telecommunication networks or customer premises.

Activities on how to efficiently connect 400 DC systems to renewable sources are one of the items under study in Q19/5. Other items include, overview of evolution of energy storage for stationary use for ICT/Telecom equipment.

Q19/5 developed Recommedations ITU-T L.1201 “Architecture of power feeding systems of up to 400 VDC”, ITU-T L.1202 “Methodologies for evaluating the performance of an up to 400 VDC power feeding system and its environmental impact”, ITU-T L.1203 “Colour and marking identification of up to 400 VDC power distribution for information and communication technology systems” and ITU-T L.1204 “Extended architecture of power feeding systems of up to 400 VDC”.

Draft Recommendation ITU-T L.1205 (ex. L.renewable) “Interfacing of renewable energy or distributed power sources to up to 400 VDC power feeding systems” was consented in October 2016. This Draft Recommendation defines the coupling of local or remote renewable energy into and up to 400VDC power system without reducing DC performances defined in [ITU-T L.1202] mainly for efficiency and reliability.

Most of studies are conducted in collaboration and with a continuous exchange of information with other standard developing organizations like ETSI and IEC.

## 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 and electromagnetic effects

– ICTs and climate change

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>

### 3.3.2 Focus Group on Smart Sustainable Cities (FG-SSC)

Cities are powerful engines of economic growth, fuelled by intensive interpersonal communication and high concentrations of specialized skills. Urbanization’s advantages are however mirrored by significant sustainability challenges, with cities today accounting for over 70 per cent of global greenhouse gas (GHG) emissions and 60-80 per cent of global energy consumption.

Given that an estimated 70 per cent of the world’s population is expected to live in cities by 2050, sustainable urbanization has become a key policy point for administrations across the world. ICTs have a crucial role to play by increasing environmental efficiency across industries and enabling innovations such as intelligent transport systems (ITS) and "smart" water, energy and waste management.

The FG-SSC acted as an open platform for smart-city stakeholders such as municipalities; academic and research institutes; non-governmental organizations (NGOs); and ICT organizations; industry forums and consortia to exchange knowledge in the interests of identifying the standardized frameworks needed to support the integration of ICT services in smart cities.

Ms Silvia Guzmán Araña acted as Chairman, Mr Saleh Al Marzouqi, Mr Ziqin Sang, Mr Sekhar Kondepudi acted as the Vice-Chairmen of the FG-SSC.

Eight meetings were held: 5-6 May 2015 (Abu Dhabi, United Arab Emirates), 4-6 March 2015 (Reading, United Kingdom), 13-16 October 2014 (Geneva, Switzerland), 19-20 June 2014 (Genoa, Italy), 5-6 March 2014 (Geneva, Switzerland), 6 December 2013 (Lima, Peru), 17 September 2013 (Madrid, Spain) and 8 May 2013 (Turin, Italy).

The FG-SSC concluded its work in May 2015 by approving 21 Technical Specifications and Reports.

### 3.3.3 Focus Group on Smart Water Management (FG-SWM)

Economic growth, climate change and rising populations are all affecting the availability of water resources. According to UN estimates, 85 per cent of the world’s population lives in the driest half of the planet; 783 million people do not have access to clean water; almost 2.5 billion do not have access to adequate sanitation; and 6 to 8 million people die annually from water-related disasters and diseases.

ICTs can play a special role by improving the distribution, management, and allocation of water. Currently, the role of ICTs in measuring, monitoring, and distributing water has not been fully identified and compiled.

The Focus Group on Smart Water Management (FG-SWM) was established by the ITU-T TSAG meeting in Geneva, 4-7 June 2013.

The FG-SWM was expected to carry out the following tasks:

– Collect and document information on national, regional and international smart water management initiatives; reporting on current activities and technical specifications.

– Specify the roles to be played by ICTs in smart water management.

– Map key stakeholders involved in the area of ICTs and smart water management.

– Develop Key Performance Indicators (KPIs) to assess the impact achieved through the use of ICTs in water-management systems.

– Develop a set of methodologies for estimating the impact of ICTs on water conservation.

– Identify water-management ICT applications and services with the potential to ensure interoperability and the benefits of economies of scale.

– Draft technical reports that address standardization gaps and identify new standardization work items to be taken up by its parent group, ITU-T Study Group 5 (Environment and climate change).

Mr Ramy Ahmed Fathy (Egypt) was the Chairman of the FG-SWM and Ms Helen Nakiguli (Uganda), Mr Jorge Grandi (UNESCO), Mr Ick Hwan Ko (Rep. of Korea), Mr Robert Hope, Mr Michael E. Sullivan (IBM), Mr Khaled M. AbuZeid (CEDARE), Mr Sang Ziqin (China) and
Mr Waleed K. AlZubari (Arabian Gulf University) were the Vice-Chairmen.

Five meetings were held: 2 March 2015 (Reading, United Kingdom), 17 Octobre 2014 (Geneva, Switzerland), 27 June 2014 (Kampala, Uganda), 3-4 March 2014 (Geneva, Switzerland) and 10 December 2013 (Lima, Peru).

The FG-SWM concluded its work in March 2015 by approving four Technical Reports.

### 3.3.4 Joint Coordination Activity on ICT & Climate Change (JCA-ICT&CC)

The Joint Coordination Activity on ICTs and Climate Change (JCA-ICT&CC) was established by TSAG in April 2009 following the successful completion of the work of the Focus Group on ICT and Climate Change. TSAG in June 2013 endorsed the continuation of JCA-ICT&CC with no changes in its terms of reference. The JCA-ICT&CC reported to ITU-T Study Group 5 which, according to the guidance from Recommendation ITU-T A.1, Clause 2.2.10, took decision on the termination of JCA.

After 6 years of successful work, JCA-ICT&CC concluded its activities in October 2015.

The purpose of the JCA-ICT&CC was to provide a visible contact point for ICT and Climate Change activities in ITU-T, seek co-operation from external bodies working in the field of ICT and climate change, and enable effective two-way communication with these bodies. External bodies included representatives from relevant SDOs such as IEC, ISO and other relevant academia, consortia or fora.

Mr Ahmed Zeddam (France) and Mr Dave Faulkner (United Kingdom) were the Co-Conveners of the JCA-ICT&CC.

Seventeen meetings were held: 14 October 2015 (Geneva, Switzerland), 9 December 2014 (Kochi, India), 10 November 2014 (virtual meeting), 10 October 2014 (virtual meeting), 5 December 2013 (Lima, Peru), 5 February 2013 (Geneva, Switzerland) (previous study period: 11 October 2012 (Geneva, Switzerland), 12 April 2012 (Geneva, Switzerland), 23 November 2011(Geneva, Switzerland), 28 September 2011 (Seoul, Korea (Republic of)), 30 June 2011 (Geneva, Switzerland), 6 May 2011 (Geneva, Switzerland), 25 March 2011 (virtual meeting), 25 November 2010 (Geneva, Switzerland), 29 September 2010 (Rome, Italy), 21 January 2010 (Geneva, Switzerland), 14 October 2009 (Geneva, Switzerland)).

### 3.3.5 Joint Coordination Activity on Smart Grids and Home Networking (JCA-SG&HN)

TSAG, at its meeting in January 2012, established the JCA-SG&HN, replacing the JCA on Home Networking (JCA-HN). The function of this JCA was coordination, inside and outside of ITU-T, of standardization work concerning all network aspects of Smart Grid and related communication as well as Home Networking.

SG5 provided inputs to JCA-HN based on the work of Q4/5 and Q8/5.

Following the successful conclusion of JCA-SG&HN in June 2013, coordination on Smart Grids and Home Networking is led by ITU-T SG15.

Mr Richard Stuart (Germany) was the JCA-SG&HN Convener, and Mr Les Brown (Germany) and Mr Stefano Galli (USA) were the JCA-SG&HN Co-conveners.

Four meetings were held during the previous study period: 13 September 2012 (Geneva, Switzerland), 31 July 2012 (Redwood City, CA, USA), 4 July 2012 (Geneva, Switzerland) and
9 May 2012 (Geneva, Switzerland).

### 3.3.6 Regional Group for Africa (SG5 RG-AFR)

In accordance with Resolution 54 (the creation of regional groups), and Resolutions 44, 59 and 72 (WTSA-08), Study Group 5, at its meeting in May 2009 created the SG5 Regional Group for Africa, in order to, on the one hand, encourage national authorities, operators and consumers from developing countries to work together and better contribute to ITU-T activities on the achievement of EMC in telecommunication installations as well as on EMF and human health and on the other hand, to enhance collaboration on all activities related to “Climate Change” in conformity with SG5 extended mandate.

Mr Guy-Michel Kouakou (Côte d'Ivoire) is the Chairman of the ITU-T SG5 Regional Group for Africa, and Ms Fatoumata Sekou Dicko (Mali), Mr Vincent Urbain Namrona (Central African Rep.) and Mr Peter Ulanga (Tanzania) are the Vice-Chairmen of the group.

Four meetings were held: Livingstone, Zambia (14-15 March 2016), Dakar, Senegal (26-27 March 2015), Kampala, Uganda (25-26 June 2014), Ouagadougou, Burkina Faso (16-17 July 2013).

### 3.3.7 Regional Group for the Arab Region (SG5 RG-ARB)

In accordance with WTSA-08 Resolution 54 (Rev. Johannesburg, 2008) on the creation of regional groups, the Arab States decided, at their “2nd meeting of Arab Permanent Group for Standardization”, held in Lebanon from 7 to 9 July 2009, to suggest the creation of a Regional Group for SG5. The main objectives of the Arab Regional Group include: to maximize the involvement of Arab States in relevant activities of ITU-T SG5, disseminate the relevant information and activities of the Study Group on Environment and Climate Change (implementation of Resolution 73, Johannesburg, 2008), the implementation of Resolution 72 (Johannesburg, 2008) regarding measurement of human exposure to electromagnetic fields, as well as the application of Resolution 76 (Johannesburg, 2008) and other activities of SG5.

Mr Tariq Al-Amri (Saudi Arabia) is the Chairman of the ITU-T SG5 Regional Group for the Arab Region, and Mr Nasser Saleh Al Marzouqi (United Arab Emirates) and Ms Nevine Mounir Tewfik Loutfi (Egypt) are the Vice-Chairmen of the group.

Two meetings were held: Kuwait City, Kuwait (25 November 2014), Rabat, Morocco (4-6 September 2013).

### 3.3.8 Regional Group for the Americas (SG5 RG-AMR)

In accordance with WTSA Resolution 44 (Bridging the standardization gap between developing and developed countries), Resolution 54 (creation of regional groups), Resolution 72 (measurement of the effects of 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 the methods of treating it), WTSA-12 approved the creation of the SG5 Regional Group for Americas. The objectives of this Regional Group include, but are not limited to, the dissemination of studies on electromagnetic environment, ICTs and climate change, especially on human exposure to EMF, to encourage the participation of countries in the Americas in Study Group 5 events and establish a link to respond to the needs of countries from the Americas regarding the issues covered by SG 5 mandate.

Mr Héctor Mario Carril (Argentina) is the Chairman of the ITU-T SG5 Regional Group for the Americas and Mr Oscar León (Colombia) -until August 2015- and Mr Agostinho Linhares de Souza Filho (Brazil) are the Vice-Chairmen of the group.

Two meetings were held: Merida, Mexico (1 October 2014) and Mendoza, Argentina (9 October 2013).

### 3.3.9 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 SG5 Regional Group for Asia Pacific. The objectives of this Regional Group include, but are not limited to, the dissemination of the studies on electromagnetic environment, human exposure to EMF, as well as ICT and climate change, to encourage the participation of Asia Pacific countries in SG5 events and to establish a link to attend to the needs of Asia Pacific countries regarding the issues covered by SG5 mandate.

Mr Li Xiao (China) is the Chairman of the ITU-T SG5 Regional Group for Asia and the Pacific and Mr **Sam Young Chung** (Rep. of Korea) and Mr **Takafumi Hashitani** (Japan) are the Vice-Chairmen of the group.

One meeting was held in Beijing, China (26 September 2014).

# 4 Observations concerning future work

ITU-T SG5 is a leading Study Group on electromagnetic compatibility and electromagnetic effects. The future work of SG5 should continue to contribute to the protection against lightning and adverse effects from power systems. To this aim, a new Question to the study the protection of telecommunication networks against lightning and adverse effects from power systems is proposed for the next Study Period. The protection against lightning includes the protection of telecommunication systems against lightning flashes and the earthing and bonding configurations applied to telecommunication installations (telecommunication buildings, remote electronic sites and customer premises). The protection against adverse effects from power systems covers the electromagnetic interference experienced by telecommunications networks due to power systems and electrified railway systems.

Moreover, the future work of SG5 should continue to study equipment resistibility, safety and protective components. As such, a new Question to study this subject is proposed for the next Study Period. The subject’s relevance rests on the fact that new types of ICT equipment are appearing in networks, in order to provide larger bandwidth to meet customers’ needs. Furthermore, different types of equipment are being interconnected at customers' premises (home network), highlighting the need to standardize and study the protection requirements for their interfaces and the effects of these interconnections on the user safety. Furthermore, the requirements for protective components and assemblies are necessary in order to protect ICT equipment against electromagnetic disturbances, such as those caused by lightning, power induction, ESD, fast transients and power contacts.

The future work topics may include (but are not limited to) the following:

– Assessment of the conformance of Radio Base Station regarding lightning protection and earthing

– Lightning protection and earthing of miniature wireless base station

– Using data of lightning positioning system for network protection

– Protection of small-size telecommunication installation with poor earthing condition

– Lightning protection and earthing of video surveillance system

– Surge protective component application guide - Metal oxide varistors

– Surge protective component application guide - Lightning isolation transformers

– Surge protective component application guide - Fuses

– Surge protective component application guide - Self-restoring current limiters

– Multiservice surge protective device application guide

– Characteristics and ratings of silicon PN junction components

– Basic requirements for surge protective devices as a series of documents

– Study the issue of surge coupling port to port in home network applications.

Concerning high frequency electromagnetic phenomena and particle radiations, studies on human exposure to electromagnetic field (EMF), electromagnetic compatibility (EMC) issues arising in telecommunication environment, and security and reliability of ICT systems from electromagnetic and particle radiations shall be pursued in the future future.

Concerning human exposure to EMF, future studies could include the following issues:

– Recommendations for management of human exposure to EMFs emitted to the environment by information communication technologies based on existing international standards

– Activities specified in WTSA-16 Resolution 72 “Measurement concerns related to human exposure to electromagnetic fields” in order to assist developing countries in human exposure assessment. Activities specified in revised Resolution 176 “Human exposure to and measurement of electromagnetic fields”, (Plenipotentiary Conference 2014, Busan)

– Review the outcome and recommendations from the World Health Organization health risk assessment of radiofrequency electromagnetic fields to be published as a monograph in the Environmental Health Criteria Series. Assess the impact and potential changes required to the ITU Recommendations on EMF

– Review the changes to the human-exposure guidelines set out by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) when a revision is published. Assess the impact and potential changes required to the ITU recommendations on EMF

– EMF exposure assessment from new and emerging technologies

Concerning studies on EMC issues arising in telecommunication environment, the study shall include the impact of popular use of new type of electric/electronic equipment and mobile terminals. The study shall include the following issues:

– Immunity requirements to mitigate interferences from wireless power transmission (WPT) systems, and grid connected power converter (GCPC) used in photovoltaic systems etc. Liaison activities with ITU-R, IEC CISPR and relevant product TCs in IEC will be required

– Recommendations to mitigate interferences from telecommunication systems to low rate wireless systems for distributed ICT devices

– Development of EMC requirements for Information Perception Equipment

– Evaluation and prediction methodology of performance degradation due to electromagnetic interference between wireless and wireline services

– Evaluation and mitigation methodology of electromagnetic disturbance between different modules in converged telecommunication equipment

– New Recommendations on emission requirements for electric and electronic equipment used in telecommunication facilities.

– New Recommendations on immunity requirements for telecommunication centre equipment in order to promote the use of wireless devices in telecommunication centre

– New Recommendations on electromagnetic environment related to body worn wireless equipment and radio devices attached to apparatuses

Concerning studies on security and reliability of ICT systems from electromagnetic and particle radiations, the following issues might be studied:

– Basic Requirements for providing information about soft errors caused by particle radiations such as high-energy neutrons created from cosmic rays or Alpha particles

– Methodologies for the total design of ICT equipment/systems to ensure the quality and reliability of ICT equipment/systems

– Requirements for soft error test facilities consisting of particle accelerators used to produce neutron radiation

– Selection of test methods, test procedures, test period and methods to monitor errors in ICT equipment subjected to testing

– Quality and reliability estimation methods and guide for applying countermeasures in light of results of soft error test

In addition, in relation to ICTs, environment and climate change, issues such as circular economy including e-waste, energy efficiency and clean energy to address the SDGs are expected to be studied.

Some future work topics may include the following:

– Circular economy

– Economic, environmental and social assessments

– Environmentally sound management of e-waste

– Climate change adaptation and disaster risk management

– Green Data Centers

– Green ICT Procurement

– Eco-design engineering for ICT infrastructures

– Key Performance Indicators (KPIs) to assess the energy efficiency of networks and networking equipment, and software networks, applications and service platforms.

– Eco-efficieny requirements in the 5G/IMT2020 context.

# 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 |
| --- | --- | --- | --- | --- |
| [K.20](http://handle.itu.int/11.1002/1000/12403) | 2015-04-22 | Superseded | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.20](http://handle.itu.int/11.1002/1000/12867) | 2016-06-29 | In force | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/12404) | 2015-04-22 | Superseded | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.21](http://handle.itu.int/11.1002/1000/12868) | 2016-06-29 | In force | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.27](http://handle.itu.int/11.1002/1000/12405) | 2015-03-01 | In force | AAP | Bonding configurations and earthing inside a telecommunication building |
| [K.44 (2012)Cor. 1](http://handle.itu.int/11.1002/1000/11902) | 2013-03-16 | Superseded | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation - Corrigendum 1 |
| [K.44 (2012)Amd. 1](http://handle.itu.int/11.1002/1000/12406) | 2015-04-22 | Superseded | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Amendment 1 |
| [K.44 (2012)Amd. 2](http://handle.itu.int/11.1002/1000/12679) | 2015-12-14 | Superseded | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Amendment 2 |
| [K.44](http://handle.itu.int/11.1002/1000/12869) | 2016-06-29 | In force | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation |
| [K.45](http://handle.itu.int/11.1002/1000/12407) | 2015-04-22 | Superseded | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.45](http://handle.itu.int/11.1002/1000/12870) | 2016-06-29 | In force | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| K.50 | 2016-07-14 | In force | AAP | Safe limits of operating voltages and currents for telecommunication systems powered over the network |
| [K.51](http://handle.itu.int/11.1002/1000/12872) | 2016-06-29 | In force | AAP | Safety criteria for telecommunication equipment |
| [K.52 (2004)Amd. 1](http://handle.itu.int/11.1002/1000/11905) | 2013-02-07 | Superseded | Agreement | Guidance on complying with limits for human exposure to electromagnetic fields - Amendment 1 |
| [K.52](http://handle.itu.int/11.1002/1000/12238) | 2014-08-29 | In force | AAP | Guidance on complying with limits for human exposure to electromagnetic fields |
| [K.57](http://handle.itu.int/11.1002/1000/12873) | 2016-06-13 | In force | AAP | Protection measures for radio base stations sited on power line towers |
| [K.58](http://handle.itu.int/11.1002/1000/12124) | 2014-02-13 | In force | AAP | EMC, resistibility and safety requirements and guidance for determining responsibility under co-located information and communication technology installations |
| [K.59](http://handle.itu.int/11.1002/1000/12687) | 2015-12-14 | In force | AAP | Electromagnetic compatibility, resistibility and safety requirements and procedures for connection to unbundled cables |
| [K.60](http://handle.itu.int/11.1002/1000/12674) | 2015-12-14 | In force | AAP | Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services |
| [K.64](http://handle.itu.int/11.1002/1000/12874) | 2016-06-29 | In force | AAP | Safe working practices for outside equipment installed in particular environments |
| [K.67](http://handle.itu.int/11.1002/1000/12673) | 2015-12-14 | In force | AAP | Expected surges on telecommunications and signalling networks due to lightning |
| [K.70 (2007) Amd.3](http://handle.itu.int/11.1002/1000/11906) | 2013-02-07 | Superseded | Agreement | Appendix I - New version v3.0.3 of the software EMF estimator |
| [K.70 (2007) Amd.4](http://handle.itu.int/11.1002/1000/12441) | 2014-12-19 | Superseded | Agreement | Appendix I – New version v.5.0 of the software EMF-estimator |
| [K.70 (2007)Amd. 5](http://handle.itu.int/11.1002/1000/12978) | 2016-04-27 | In force | Agreement | Appendix I – New version v.6.01 of the software EMF-estimator |
| [K.74](http://handle.itu.int/11.1002/1000/12408) | 2015-03-01 | In force | AAP | Electromagnetic compatibility, resistibility and safety requirements for home network devices |
| [K.75](http://handle.itu.int/11.1002/1000/12875) | 2016-06-29 | In force | AAP | Classification of interface for application of standards on resistibility and safety of telecommunication equipment |
| [K.77 (2009)Amd. 1](http://handle.itu.int/11.1002/1000/12116) | 2013-12-13 | In force | Agreement | New Appendix III: Characterizing thermally protected MOVs using a.c. step stress testing |
| [K.78](http://handle.itu.int/11.1002/1000/12876) | 2016-06-29 | In force | AAP | High altitude electromagnetic pulse immunity guide for telecommunication centres |
| [K.79](http://handle.itu.int/11.1002/1000/12409) | 2015-03-01 | In force | AAP | Electromagnetic characterization of the radiated environment in the 2.4 GHz ISM band  |
| [K.81](http://handle.itu.int/11.1002/1000/12287) | 2014-08-29 | Superseded | AAP | High-power electromagnetic immunity guide for telecommunication systems |
| [K.81](http://handle.itu.int/11.1002/1000/12877) | 2016-06-29 | In force | AAP | High-power electromagnetic immunity guide for telecommunication systems |
| [K.83 (2011) Amd.1](http://handle.itu.int/11.1002/1000/12224) | 2014-07-29 | In force | Agreement | Updates to the Introduction and Appendix I of ITU-T K.83 |
| [K.84 (2011) Amd.1](http://handle.itu.int/11.1002/1000/12223) | 2014-07-29 | In force | Agreement | Deletion of a bibliographic reference |
| [K.87](http://handle.itu.int/11.1002/1000/12878) | 2016-06-29 | In force | AAP | Guide for the application of electromagnetic security requirements - Overview |
| [K.95](http://handle.itu.int/11.1002/1000/12128) | 2014-02-13 | Superseded | AAP | Surge parameters of isolating transformers used in telecommunication devices and equipment |
| [K.95](http://handle.itu.int/11.1002/1000/12879) | 2016-06-29 | In force | AAP | Surge parameters of isolating transformers used in telecommunication devices and equipment |
| [K.96](http://handle.itu.int/11.1002/1000/12129) | 2014-02-13 | In force | AAP | Surge protective components: Overview of surge mitigation functions and technologies |
| [K.96 (2014)Amd. 1](http://handle.itu.int/11.1002/1000/12442) | 2014-12-19 | In force | Agreement | Appendix II - Alternative duration measurement method for 1.2/50-8/20 and 10/700 surge generator impulses |
| [K.97](http://handle.itu.int/11.1002/1000/12130) | 2014-02-13 | In force | AAP | Lightning protection of distributed base stations |
| [K.98](http://handle.itu.int/11.1002/1000/12288) | 2014-08-29 | In force | AAP | Overvoltage protection guide for telecommunication equipment installed in customer premises |
| [K.99](http://handle.itu.int/11.1002/1000/12289) | 2014-08-29 | In force | AAP | Surge protective component application guide - Gas discharge tubes |
| [K.100](http://handle.itu.int/11.1002/1000/12290) | 2014-12-07 | 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.101](http://handle.itu.int/11.1002/1000/12291) | 2014-12-07 | In force | AAP | Shielding factors for lightning protection |
| [K.102](http://handle.itu.int/11.1002/1000/12292) | 2014-08-29 | In force | AAP | Parameters of fixed-voltage thyristor overvoltage protector components used for the protection of telecommunication installations |
| [K.103](http://handle.itu.int/11.1002/1000/12423) | 2015-03-01 | In force | AAP | Surge protective component application guide - Silicon PN junction components  |
| [K.104](http://handle.itu.int/11.1002/1000/12424) | 2015-03-01 | In force | AAP | Method for identifying the transfer potential of the earth potential rise from high or medium voltage networks to the earthing system or neutral of low voltage networks |
| [K.105](http://handle.itu.int/11.1002/1000/12425) | 2015-03-01 | In force | AAP | Lightning protection of photovoltaic power supply systems feeding radio base stations |
| [K.106](http://handle.itu.int/11.1002/1000/12426) | 2015-03-01 | In force | AAP | Techniques to mitigate interference between radio devices and cable or equipment connected to wired broadband networks and cable television networks  |
| [K.107](http://handle.itu.int/11.1002/1000/12672) | 2015-11-29 | In force | AAP | Method for determining the impedance to earth of earthing systems |
| [K.108](http://handle.itu.int/11.1002/1000/12671) | 2015-11-29 | In force | AAP | Joint use of poles by telecommunication and solidly earthed power lines |
| [K.109](http://handle.itu.int/11.1002/1000/12670) | 2015-11-29 | In force | AAP | Installation of telecommunication equipment on utility poles |
| [K.110](http://handle.itu.int/11.1002/1000/12669) | 2015-12-14 | In force | AAP | Lightning protection of the dedicated transformer for radio base stations |
| [K.111](http://handle.itu.int/11.1002/1000/12668) | 2015-11-29 | In force | AAP | Protection of surrounding structures of telecommunication towers against lightning |
| [K.112](http://handle.itu.int/11.1002/1000/12667) | 2015-12-14 | In force | AAP | Lightning protection, earthing and bonding: Practical procedures for radio base stations |
| [K.113](http://handle.itu.int/11.1002/1000/12666) | 2015-11-29 | In force | AAP | Generation of radiofrequency electromagnetic field level maps |
| [K.114](http://handle.itu.int/11.1002/1000/12665) | 2015-11-29 | In force | AAP | Electromagnetic compatibility requirements and measurement methods for digital cellular mobile communication base station equipment |
| [K.115](http://handle.itu.int/11.1002/1000/12664) | 2015-11-29 | In force | AAP | Mitigation methods against electromagnetic security threats |
| [K.116](http://handle.itu.int/11.1002/1000/12663) | 2015-11-29 | In force | AAP | Electromagnetic compatibility requirements and test methods for radio telecommunication terminal equipment |
| L.1002 | 2016-10-14 | In force | AAP | External universal power adapter solutions for portable information and communication technology devices |
| [L.1005](http://handle.itu.int/11.1002/1000/12132) | 2014-02-13 | In force | AAP | Test suites for assessment of the universal charger solution |
| [L.1010](http://handle.itu.int/11.1002/1000/12133) | 2014-02-13 | In force | AAP | Green battery solutions for mobile phones and other hand-held information and communication technology devices |
| [L.1101](http://handle.itu.int/11.1002/1000/12134) | 2014-03-22 | In force | AAP | Measurement methods to characterize rare metals in information and communication technology goods |
| L.1102 | 2016-07-14 | In force | AAP | Use of printed labels for communicating information on rare metals in information and communication technology goods |
| [L.1201](http://handle.itu.int/11.1002/1000/12135) | 2014-03-01 | In force | AAP | Architecture of power feeding systems of up to 400 VDC |
| [L.1202](http://handle.itu.int/11.1002/1000/12427) | 2015-04-22 | In force | AAP | Methodologies for evaluating the performance of an up to 400 VDC power feeding system and its environmental impact |
| [L.1203](http://handle.itu.int/11.1002/1000/12659) | 2016-02-22 | In force | AAP | Colour and marking identification of up to 400 VDC power distribution for information and communication technology systems |
| [L.1204](http://handle.itu.int/11.1002/1000/12882) | 2016-06-29 | In force | AAP | Extented architecture of power feeding systems of up to 400 VDC |
| [L.1300](http://handle.itu.int/11.1002/1000/12204) | 2014-06-29 | In force | AAP | Best practices for green data centres |
| [L.1301](http://handle.itu.int/11.1002/1000/12428) | 2015-05-07 | In force | AAP | Minimum data set and communication interface requirements for data centre energy management |
| [L.1302](http://handle.itu.int/11.1002/1000/12630) | 2015-11-29 | In force | AAP | Assessment of energy efficiency on infrastructure in data centres and telecom centres |
| [L.1310](http://handle.itu.int/11.1002/1000/12205) | 2014-08-22 | In force | AAP | Energy efficiency metrics and measurement methods for telecommunication equipment |
| [L.1320](http://handle.itu.int/11.1002/1000/12136) | 2014-03-22 | In force | AAP | Energy efficiency metrics and measurement for power and cooling equipment for telecommunications and data centres |
| [L.1321](http://handle.itu.int/11.1002/1000/12429) | 2015-03-01 | In force | AAP | Reference operational model and interface for improving energy efficiency of ICT network hosts |
| [L.1330](http://handle.itu.int/11.1002/1000/12430) | 2015-03-01 | In force | AAP | Energy efficiency measurement and metrics for telecommunication networks |
| [L.1340](http://handle.itu.int/11.1002/1000/12137) | 2014-02-13 | In force | AAP | Informative values on the energy efficiency of telecommunication equipment |
| L.1350 | 2016-10-07 | In force | AAP | Energy efficiency metrics of base station site |
| [L.1410](http://handle.itu.int/11.1002/1000/12207) | 2014-12-07 | In force | AAP | Methodology for environmental life cycle assessments of information and communication technology goods, networks and services |
| [L.1430](http://handle.itu.int/11.1002/1000/11904) | 2013-12-13 | In force | AAP | Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects |
| [L.1440](http://handle.itu.int/11.1002/1000/12431) | 2015-10-23 | In force | AAP | Methodology for environmental impact assessment of information and communication technologies at city level |
| [L.1500](http://handle.itu.int/11.1002/1000/12138) | 2014-06-22 | In force | AAP | Framework for information and communication technologies and adaptation to the effects of climate change |
| [L.1501](http://handle.itu.int/11.1002/1000/12206) | 2014-12-22 | In force | AAP | Best practices on how countries can utilize ICTs to adapt to the effects of climate change |
| [L.1502](http://handle.itu.int/11.1002/1000/12629) | 2015-11-29 | In force | AAP | Adapting information and communication technology infrastructure to the effects of climate change |
| [L.1503](http://handle.itu.int/11.1002/1000/12628) | 2016-06-22 | In force | AAP | Information and communication technologies for climate change adaptation in cities |
| [Y.4900/L.1600](http://handle.itu.int/11.1002/1000/12627) | 2016-06-06 | In force | AAP | Overview of key performance indicators in smart sustainable cities |
| [Y.4901/L.1601](http://handle.itu.int/11.1002/1000/12661) | 2016-06-06 | In force | AAP | Key performance indicators related to the use of information and communication technology in smart sustainable cities |
| [Y.4902/L.1602](http://handle.itu.int/11.1002/1000/12662) | 2016-06-06 | In force | AAP | Key performance indicators related to the sustainability impacts of information and communication technology in smart sustainable cities |
| Y.4903/L.1603 | 2016-10-07 | In force | AAP | Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals |
| [L.1700](http://handle.itu.int/11.1002/1000/12885) | 2016-06-13 | In force | AAP | Requirements and framework for low-cost sustainable telecommunications infrastructure for rural communications in developing countries |

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

| Recommendation | Consent/Determination | TAP/AAP | Title |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| [K.20](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13181) | 2016-10-14 | AAP | Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents |
| [K.21](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13182) | 2016-10-14 | AAP | Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents |
| [K.44](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13183) | 2016-10-14 | AAP | Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendation |
| [K.45](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13184) | 2016-10-14 | AAP | Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents |
| [K.50](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13185) | 2016-10-14 | AAP | Safe limits for operating voltages and currents in telecommunication systems powered over the network |
| [K.52](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10357) | 2016-10-14 | AAP | Guidance on complying with limits for human exposure to electromagnetic fields |
| [K.93](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10180) | 2016-10-14 | AAP | Immunity of home network devices to electromagnetic disturbance |
| [K.117](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=8758) | 2016-10-14 | AAP | Primary protector parameters for the surge protection of equipment Ethernet ports |
| [K.118](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13160) | 2016-10-14 | AAP | Requirements for Lightning Protection of Fibre To The distribution point (FTTdp) Equipment |
| [K.119](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10028) | 2016-10-14 | AAP | Conformance Assessment of Radio Base Stations Regarding Lightning Protection and Earthing |
| [K.120](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10355) | 2016-10-14 | AAP | Lightning Protection and Earthing of Miniature Base Station |
| [K.121](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10178) | 2016-10-14 | AAP | Guidance on the Environmental Management for Compliance with Radio Frequency EMF Limits for Radiocommunication Base Stations |
| [K.122](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10677) | 2016-10-14 | AAP | Exposure levels in the close proximity of the radiocommunication antennas |
| [K.123](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10181) | 2016-10-14 | AAP | EMC requirements for electrical equipment in telecommunication facilities |
| [K.124](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10682) | 2016-10-14 | AAP | Overview of particle radiation effects on telecommunications systems |
| [L.1006](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10138) | 2016-10-14 | AAP | Test suites for assessment of the External universal power adapter solutions for stationary information and communication technology devices |
| [L.1007](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10150) | 2016-10-14 | AAP | Test suites for assessment of the External universal power adapter solutions for portable information and communication technology devices |
| [L.1205](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10018) | 2016-10-14 | AAP | Interfacing of renewable energy or distributed power sources to up to 400 VDC power feeding systems |
| [L.1315](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10148) | 2016-10-14 | AAP | Standardization terms and trends in energy efficiency |
| [L.1325](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10369) | 2016-10-14 | AAP | Green ICT solutions for telecom network facilities |
| [L.1331](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10710) | 2016-10-14 | AAP | Assessment of mobile network energy efficiency |
| [L.1360](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10368) | 2016-10-14 | AAP | Energy control of SDN architecture |
| [L.1504](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10366) | 2016-10-14 | AAP | ICT and adaptation of agriculture to the effects of climate change |

TABLE 9
Study Group 5 – Recommendation deleted during study period

| Recommendation | Last version | Withdrawal date | Title |
| --- | --- | --- | --- |
| K.25 | 2000-02-25 | 2013-01-25 | Protection of optical fibre cables |
| K.5 | 1988-11-25 | ITU-T SG5 agreed the deletion of this Recommendation on 14 October 2016. ([Circular Letter 251](http://www.itu.int/md/T13-TSB-CIR-0251/en)) | Joint use of poles for electricity distribution and for telecommunications |

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

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

TABLE 11
Study Group 5 – Supplements

| Recommendation | Date | Status | Title |
| --- | --- | --- | --- |
| [K Suppl. 1](http://handle.itu.int/11.1002/1000/12304) | 2014-07-29 | In force | ITU-T K.91 – Guide on electromagnetic fields and health  |
| [K Suppl. 2](http://handle.itu.int/11.1002/1000/12444) | 2014-12-19 | In force | ITU-T K.52 - Calculator for equivalent isotropic radiated power as described in Recommendation ITU-T K.52 |
| [K Suppl. 3](http://handle.itu.int/11.1002/1000/12686) | 2015-10-23 | In force | ITU-T K.20, K.21, K.45, K.82 – Additional criteria to protect telecommunication cabling during a power cross event |
| [K Suppl. 4](http://handle.itu.int/11.1002/1000/12688) | 2015-10-23 | In force | ITU-T K.91 - Electromagnetic field considerations in smart sustainable cities |
| [K Suppl. 5](http://handle.itu.int/11.1002/1000/12965) | 2016-04-27 | In force | ITU-T K.81 - Estimation examples of the high-power electromagnetic threat and vulnerability for telecommunication systems |
| [K Suppl. 6](http://handle.itu.int/11.1002/1000/12965) | 2016-10-14 | In force | ITU-T K.115 - Measuring shielding effectiveness using normalized site attenuation in free space |
| [L Suppl. 1](http://handle.itu.int/11.1002/1000/11908) | 2013-02-07 | In force | ITU-T L.1310 – Supplement on energy efficiency for telecommunication equipment |
| [L Suppl. 2](http://handle.itu.int/11.1002/1000/12140) | 2013-12-13 | In force | ITU-T L.1410 – Case studies |
| [L Suppl. 3](http://handle.itu.int/11.1002/1000/12141) | 2013-12-13 | In force | ITU-T L.1430 – Guidance on practical application of ITU-T L.1430 to a real-time navigation service |
| [L Suppl. 4](http://handle.itu.int/11.1002/1000/12432) | 2014-12-19 | Superseded | Guidelines for developing a sustainable e-waste management system |
| [L Suppl. 4](http://handle.itu.int/11.1002/1000/12890) | 2016-04-27 | In force | Guidelines for developing a sustainable e-waste management system |
| [L Suppl. 5](http://handle.itu.int/11.1002/1000/12433) | 2014-12-19 | In force | Life-cycle management of ICT goods |
| [L Suppl. 6](http://handle.itu.int/11.1002/1000/12434) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on a validation test of a data centre cooling method using renewable energy in a cold region |
| [L Suppl. 7](http://handle.itu.int/11.1002/1000/12435) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on rationale for minimum data set for evaluating energy efficiency and for controlling data centre equipment in view of power saving |
| [L Suppl. 8](http://handle.itu.int/11.1002/1000/12436) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on potential for primary energy savings in TLC/ICT centres through free cooling |
| [L Suppl. 9](http://handle.itu.int/11.1002/1000/12437) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on case study of reduction of air-conditioning energy by optical fibre based thermometry |
| [L Suppl. 10](http://handle.itu.int/11.1002/1000/12438) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on verification experiments related to increase of efficiency of air-conditioning and control technologies at a data centre |
| [L Suppl. 11](http://handle.itu.int/11.1002/1000/12439) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on verification test and feasibility study of energy and space efficient cooling systems for data centres with high density ICT devices |
| [L Suppl. 12](http://handle.itu.int/11.1002/1000/12440) | 2014-12-19 | In force | ITU-T L.1300 - Supplement on experimental studies on plates and ducts installed at equipment inlets and outlets |
| [L Suppl. 13](http://handle.itu.int/11.1002/1000/12689) | 2015-10-23 | In force | ITU-T L.1410 - Case study: A hybrid approach-based comparative analysis of the environmental impact of a baseline data centre and an energy-efficient data centre  |
| [L Suppl. 14](http://handle.itu.int/11.1002/1000/12690) | 2015-10-23 | In force | ITU-T L.1500 - Standardization gap analysis for smart water management  |
| [L Suppl. 15](http://handle.itu.int/11.1002/1000/12691) | 2015-10-23 | In force | ITU-T L.1500 - Requirements for water sensing and early warning systems |
| [L Suppl. 16](http://handle.itu.int/11.1002/1000/12692) | 2015-10-23 | Superseded\* | ITU-T L.1500 - Smart water management in cities\* (in force now as Y.Suppl.36 to Y.4550-Y.4699) |
| [L Suppl. 17](http://handle.itu.int/11.1002/1000/12693) | 2015-10-23 | Superseded\* | ITU-T L.1600 - Definition for smart sustainable city\* (in force now as Y.Suppl.37 to Y.4050-Y.4099) |
| [L Suppl. 18](http://handle.itu.int/11.1002/1000/12694) | 2015-10-23 | Superseded\* | ITU-T L.1600 - Smart sustainable cities: an analysis of definitions\* (in force now as Y.Suppl.38 to Y.4050-Y.4099) |
| [L Suppl. 19](http://handle.itu.int/11.1002/1000/12695) | 2015-10-23 | Superseded\* | ITU-T L.1600 - Key performance indicators definitions for smart sustainable cities\* (in force now as Y.Suppl.39 to Y.4900) |
| [L Suppl. 20](http://handle.itu.int/11.1002/1000/12696) | 2015-10-23 | In force | Green public ICT procurement  |
| [L Suppl. 21](http://handle.itu.int/11.1002/1000/12891) | 2016-04-27 | In force | Implementation guidance for ICT SME supply chains due diligence for conflict minerals |
| [L Suppl. 22](http://handle.itu.int/11.1002/1000/12964) | 2016-04-27 | In force | ITU-T L.1700 - Low-cost sustainable telecommunication for rural communications in developing countries using fibre optic cable |
| [L Suppl. 23](http://handle.itu.int/11.1002/1000/12963) | 2016-04-27 | In force | ITU-T L.1700 - Low-cost sustainable telecommunications for rural communications in developing countries using microwave and millimetre radio links |
| [L Suppl. 24](http://handle.itu.int/11.1002/1000/12892) | 2016-04-27 | In force | ITU-T L.1500 - Overview of climate change effects and possible impacts |
| [L Suppl. 25](http://handle.itu.int/11.1002/1000/12893) | 2016-04-27 | In force | ITU-T L.1502 - Best practices for infrastructure adaptation to climate change |
| [L Suppl. 26](http://handle.itu.int/11.1002/1000/12894) | 2016-04-27 | In force | ITU-T L.1410 - Case Study: the assessment of greenhouse gas emission of a hybrid satellite broadband system over its life cycle |
| [L Suppl. 2](http://handle.itu.int/11.1002/1000/12894)7 | 2016-10-14 | In force | Supplement on success stories on e-waste management |
| [L Suppl. 2](http://handle.itu.int/11.1002/1000/12894)8 | 2016-10-14 | In force | Circular Economy in Information and Communication Technology; definition of approaches, concepts and metrics |
| [L Suppl. 2](http://handle.itu.int/11.1002/1000/12894)9 | 2016-10-14 | In force | ITU-T L.1700 - Low-cost sustainable telecommunication for rural communications in developing countries using Cellular Radio Technologies |
| [L Suppl. 30](http://handle.itu.int/11.1002/1000/12894) | 2016-10-14 | In force | ITU-T L.1700 - Setting up a low-cost sustainable telecommunications network for rural communications in developing countries using cellular network with capacity transfer |
| [L Suppl.](http://handle.itu.int/11.1002/1000/12894) 31 | 2016-10-14 | In force | ITU-T L.1700 - Setting up a low-cost sustainable telecommunications network for rural communications in developing countries using satellite systems |
| [L Suppl.](http://handle.itu.int/11.1002/1000/12894) 32 | 2016-10-14 | In force | Supplement for eco-specifications and rating criteria for mobile phones eco-rating programmes |
| [L Suppl.](http://handle.itu.int/11.1002/1000/12894) 33 | 2016-10-14 | In force | Assessment of Energy Consumption of ICT Services |
| [L Suppl.](http://handle.itu.int/11.1002/1000/12894) 34 | 2016-10-14 | In force | ITU-T L.1700 - Example of hybrid LCA of the aggregated second order effects of selected ICT services |

TABLE 12
Study Group 5 – Technical Papers and tutorials

| Technical Papers | Date | Status | Title |
| --- | --- | --- | --- |
| [TP on best practices for network infrastructure](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=8790) | 13/12/2013 | In force | Network infrastructure best practices |
| [TP on Case study of reduction of air-conditioning energy by optical fiber based thermometry](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10011) | 13/12/2013 | In force | Case study of reduction of air-conditioning energy by optical fiber based thermometry |
| [TP on Experimental studies on plates and ducts installed at equipment inlets and outlets](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10005) | 13/12/2013 | In force | Experimental studies on plates and ducts installed at equipment inlets and outlets |
| [TP on Potential for primary energy savings in TLC/ICT centres through free cooling](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10007) | 13/12/2013 | In force | Potential for primary energy savings in TLC/ICT centres through free cooling |
| [TP on Rationale for minimum data set for evaluating energy efficiency and for controlling data centre equipment in view of power saving](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10006) | 13/12/2013 | In force | Rationale for minimum data set for evaluating energy efficiency and for controlling data centre equipment in view of power saving |
| [TP on Validation test of a data centre cooling method using renewable energy in a cold region](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10009) | 13/12/2013 | In force | Validation test of a data centre cooling method using renewable energy in a cold region |
| [TP on Verification experiments related to increase of efficiency of air-conditioning and control technologies at a data centre](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10010) | 13/12/2013 | In force | Verification experiments related to increase of efficiency of air-conditioning and control technologies at a data centre |
| [TP on Verification test and feasibility study of energy and space efficient cooling systems for data centres with high density ICT devices](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10008) | 13/12/2013 | In force | Verification test and feasibility study of energy and space efficient cooling systems for data centres with high density ICT devices |

TABLE 13
FG-SSC – Technical Reports and Specifications

|  | Date | Status | Title |
| --- | --- | --- | --- |
| Technical report  | 10/2014 | New | An overview of smart sustainable cities and the role of information and communication technologies |
| Technical Report | 10/2014 | New | Smart sustainable cities: an analysis of definitions |
| Technical Report | 05/2015 | New | Smart sustainable cities: a guide for city leaders |
| Technical Report | 05/2015 | New | Master plan for smart sustainable cities |
| Technical Report | 03/2015 | New | Setting the stage for stakeholders’ engagement in smart sustainable cities |
| Technical Report | 05/2015 | New | Overview of smart sustainable cities infrastructure |
| Technical Specifications | 05/2015 | New | Setting the framework for an ICT architecture of a smart sustainable city |
| Technical Specifications | 05/2015 | New | Multi-service infrastructure for smart sustainable cities in new-development areas |
| Technical Report | 03/2015 | New | Cybersecurity, data protection and cyber resilience in smart sustainable cities |
| Technical Report | 05/2015 | New | Intelligent sustainable buildings for smart sustainable cities |
| Technical Report | 10/2014 | New | Smart water management in cities |
| Technical Report | 03/2015 | New | Information and communication technologies for climate change adaptation in cities |
| Technical Report | 10/2014 | New | Electromagnetic field (EMF) considerations in smart sustainable cities |
| Technical Report | 03/2015 | New | Integrated management for smart sustainable cities |
| Technical Report | 05/2015 | New | Anonymization infrastructure and open data in smart sustainable cities |
| Technical Specifications | 10/2014 | New | Overview of key performance indicators in smart sustainable cities |
| Technical Specifications | 03/2015 | New | Key performance indicators related to the use of information and communication technology in smart sustainable cities |
| Technical Specifications | 03/2015 | New | Key performance indicators related to the sustainability impacts of information and communication technology in smart sustainable cities |
| Technical Report | 03/2015 | New | Key performance indicators definitions for smart sustainable cities |
| Technical Report | 03/2015 | New | Standardization roadmap for smart sustainable cities |
| Technical Report | 05/2015 | New | Standardization activities for smart sustainable cities |

TABLE 14
FG-SWM – Technical Reports

|  | Date | Status | Title |
| --- | --- | --- | --- |
| Technical Report | 03/2015 | New | Requirements for water sensing and early warning systems |
| Technical Report | 03/2015 | New | Smart water management – Global initiatives and key stakeholders |
| Technical Report | 03/2015 | New | Standardization gap analysis for smart water management |
| Technical Report | 03/2015 | New | The role of ICTs in water resource management |

ANNEX 2

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

**(WTSA Resolution 2)**

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-12 Resolution 2 (2016)](http://www.itu.int/en/ITU-T/wtsa16/Pages/documents.aspx).

#### PART 1 ‑ General areas of study

#### Study Group 5

**Environment and climate change to address the Sustainable Development Goals (SDGs)[[1]](#footnote-1)**

ITU-T Study Group 5 is responsible for studying ICT environmental aspects of electromagnetic phenomena and climate change.

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.

It is responsible for studies:

– relating to protection of telecommunication networks and equipment from interference and lightning;

– related to electromagnetic compatibility (EMC), particle radiation effects, and assessment of human exposure to electromagnetic fields produced by ICT installations and devices, including cellular phones and base stations;

– on the existing copper network outside plant and related indoor installations;

– relating to achieving energy efficiency and sustainable clean energy;

– on methodologies for assessing the environmental impact of ICT, publishing guidelines for using ICTs in an eco-friendly way, dealing with e-waste issues also in relation to counterfeit devices, enhance rare metal recycling and energy efficiency of ICT, including infrastructures.

Study Group 5 is responsible for studies on how to use ICTs to help countries and the ICT sector to adapt to the effects of environmental challenges, including climate change in line with the Sustainable Development Goals (SDGs).

Study Group 5 also identifies the needs for more consistent and standardized eco-friendly practices for the ICT sector (e.g. labelling, procurement practices, standardized power supplies/connectors, eco-rating schemes).

#### PART 2 ‑ Lead Study Groups in specific areas of study[[2]](#footnote-2)

SG5 Lead study group on electromagnetic compatibility, lightning protection and electromagnetic effects
Lead study group on ICTs and climate change, circular economy including e-waste, energy efficiency and clean energy to address the SDGs

Annex B
(to WTSA Resolution 2)

Points of guidance to study groups for the development
of the post-2016 work programme

ITU-T Study Group 5 will develop Recommendations, Supplements and other publications related to:

– protection of ICT networks and equipment from interference, lightning, and power faults;

– electromagnetic compatibility (EMC);

– the assessments of human exposure to electromagnetic fields produced by ICT installations and devices;

– safety and implementation aspects related to ICT powering and to powering through networks and sites;

– components and application references for protection of ICT equipment and the telecommunication network;

– ICTs, circular economy, energy efficiency and climate change to reach the Sustainable Development Goals (including Paris Agreement, Connect 2020 Agenda, SDGs, etc.);

– study lifecycle and rare metal recycling approach for ICT equipment to minimize the environmental and health impact of e-waste;

– 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;

– study of methodologies, such as recycling, that reduce environmental effects of ICT facilities and equipment;

– setting up a low cost sustainable ICT infrastructure to connect the unconnected;

– studies on 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;

– environmentally sound management of e-waste and ICT eco-friendly design, including dealing with counterfeit devices;

– assessment of sustainability impact of ICT to promote Sustainable Development Goals.

Study Group 5 will also take care of the aspects related to the deployment of new services on existing copper networks, such as the co-existence of different services from different providers in the same cable or same cable bundle and the positioning of components (e.g. surge protection components) inside the central office main distribution frame, including also the need to provide performance requirements of new copper-pair cables designed to support a higher bandwidth.

This activity is related to the continuation of studies on the local loop unbundling (LLU), the continuing merger of fibre with copper, with the scope to provide all the correct technical solutions needed to assure network integrity and interoperability, the easy use of equipment and access security in a context where operators can interact without negatively affecting the quality of service defined by regulatory and administrative issues.

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 study of environment, circular economy, energy efficiency and climate change to address Sustainable Development Goals.

Annex C
(to WTSA Resolution 2)

List of Recommendations under the responsibility of the respective
study groups and TSAG in the 2017-2020 study period

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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1. TSAG during its meeting held on 18-22 July 2016 in Geneva proposed some changes which are contained in WTSA Document 24. [↑](#footnote-ref-1)
2. TSAG during its meeting held on 18-22 July 2016 in Geneva proposed some changes which are contained in WTSA Document 24. [↑](#footnote-ref-2)