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Report by the Secretary-General

Report on the Implementation of the Strategic Plan and activities of the Union, April 2019 – April 2020

Summary

This annual report covers activities since April 2019 to April 2020, reporting on the ITU-wide strategic goals and targets, and the Sector and Inter-sectoral objectives. It combines the Annual Activities Report (as required by No.102 of the CV) and the Report on the Implementation of the Strategic Plan (as required by No. 61 of the CV and Resolution 71 (Rev. Dubai, 2018)).

Considerable effort has gone into compiling this document so as to include all the relevant activity in a results-oriented, evidence-based and thematic-oriented way, including analytical figures showing overall progress towards the Connect 2030 targets, and detailed information on the indicators endorsed by membership in the operational plans of the three Sectors and the General Secretariat.

This report is the first one on the implementation of the 2020-2023 Strategic Plan adopted in PP-18.

Action required

The Council is invited **to approve** the report.

References

Plenipotentiary Resolutions 71, 151 and 200; and No. 102 and No. 61 of the CV

Letter from the Secretary-General

Dear members of the ITU family,

There is no higher calling than serving others. All of you, be it in public service, in business, or in academia, are bound by the simple but powerful belief that technology can be a source of good in this world. This has never been more apparent than in our response to the global Covid-19 crisis.

We, as individuals and institutions, are facing one of our biggest tests and ITU members have stepped up and engaged in activities that have proven essential in saving lives and keeping the economy working, from handling the surge in digital traffic experienced by networks to providing billions with vital health messaging, including those who are not able to connect to the Internet for information. And this goes to the heart of our organization's mission: connecting all the world's people.

What we achieved this past year has prepared us for this moment. The ITU World Radiocommunication Conference 2019 (WRC-19) forged pathways in key areas such as mobile and fixed broadband communications, radiocommunications for transportation systems, and satellite services. In the present crisis, WRC-19 serves as a reminder of the importance of digital communications and how interconnected we all are. Now, more than ever, the critical work we have done on spectrum and orbit regulation and management, standardization, emerging technologies, the environment and smart sustainable cities and communities, cybersecurity, and digital inclusion are all part of the solution to today's crisis.

Public and private authorities everywhere are converting their activities to digital. As a result, ITU's membership is growing and becoming ever more diverse, with large and small companies active in different sectors of the economy. This keeps our organization on the cutting edge of innovation and helps strengthen the public-private partnerships critical to delivering on the promise of the digital revolution. As the human tragedy that is the Covid-19 pandemic now threatens to devastate economies and increase inequalities between and within countries, I am confident that the ITU family will once again rise to the challenge and work together to turn the digital revolution into a development revolution for all.

ITU has seen the world change and overcome many global crises in our 155-year-old history, and we have always come out stronger. I know I can count on all of you to continue this legacy, to continue leveraging digital technologies to help defeat Covid-19 and make us safer, stronger, and more connected.

Be well,

Houlin Zhao

Secretary-General, International Telecommunication Union

About ITU

The International Telecommunication Union (ITU) is the specialized United Nations agency for information and communication technologies (ICTs), driving innovation in ICTs together with 193 Member States and a membership of over 900 companies, universities, and international and regional organizations. Established 155 years ago in 1865, ITU is the intergovernmental body responsible for coordinating the shared global use of the radio spectrum, promoting international cooperation in assigning satellite orbits, improving communication infrastructure in the developing world, and establishing the worldwide standards that foster seamless interconnection of a vast range of communications systems. From broadband networks to cutting-edge wireless technologies, aeronautical and maritime navigation, radio astronomy, oceanographic and satellite-based earth monitoring as well as converging fixed-mobile phone, Internet and broadcasting technologies, ITU is committed to connecting the world. For more information, visit: www.itu.int.

Year in review

24 April 2019 - More than 170 countries worldwide promote tech studies to girls and women on 'Girls in ICT Day'
Digital skills give an advantage in a competitive job market, provide a higher salary and enhance career mobility for girls and women in increasingly digital societies.

14 May 2019 - World Telecommunication and Information Society Day (WTISD), 17 May 2019, advocates for "Bridging the Standardization Gap"
ITU international standards enable digital transformation on a global scale.

28 May 2019 - 3rd AI for Good Global Summit targets impact on a global scale and gives rise to 'AI Commons'
Summit gathered over 37 UN agencies to showcase how artificial intelligence (AI) will accelerate sustainable development and introduced a new framework for collaboration on AI-related issues across the UN system.

09 June 2019 - **ITU Council** 2019 opens in Geneva.

10 July 2019 - 19th Global Symposium for Regulators turned spotlight on the future of regulation
Collaborative, 5th-generation regulation event shares best regulatory practices to bring the remaining 49% of the world online.

09 September 2019 - ITU Telecom World 2019 held in under the theme "Innovating together: connectivity that matters"
Heads of State, Ministers, key industry players from major corporates and tech SMEs gathered in Budapest, Hungary, to showcase how innovation and connectivity improve lives across the world.

28 October 2019 - ITU World Radiocommunication Conference (WRC-19) forges pathways for future digital communications
WRC-19 agreed on key parameters for scarce radio-frequency spectrum management in rapidly evolving terrestrial communication services, as well as geostationary and non-geostationary-satellite orbits for space-based communication technologies.

20 November 2019 - ITU marks 70 years of television standards work
World TV Day highlighted convergence of new digital technologies in broadcast and Internet services for affordable global footprint.

08 January 2020 - The Futurecasters Global Young Visionaries Summit was hosted and co-organized by ITU and the Model UN programme of Ferney-Voltaire, France.
The event was a programme of youth-oriented consultations aimed at bringing the voices of young people to all major ITU development discussions and activities.

27 February 2020 - ICT industry to reduce greenhouse gas emissions by 45 per cent by 2030
ITU, GeSI, GSMA and SBTi set science-based pathway in line with the Paris Agreement established in the framework of the UNFCCC.

16 March 2020 – ITU defines response to adjust to the outbreak of COVID-19
New working methods – enhanced telepresence, virtual meetings, and staff teleworking - to adjust to the impact of the global COVIC-19 pandemic. See section 1.8.

19 March 2020 - New guidelines to assist countries develop national emergency telecommunication plans
Conducting emergency telecommunication exercises and drills is vital to test the effectiveness of disaster response plans and build preparedness.

23 March 2020 - New ITU Global Network Resiliency Platform to help protect telecommunication networks during the COVID-19 crisis
#REG4COVID platform is launched to assist governments and the private sector in ensuring that networks are kept resilient and telecommunication services are available to all.

03 April 2020 - Special emergency session of the Broadband Commission pushed for action to extend Internet access and boost capacity to fight COVID-19.
UN advisory body sets out an Agenda for Action to ensure the networks the whole world is now relying on are robust, resilient and within reach of as many people as possible.

Contents

Pages

1. Key themes of work

1.1 WRC-19 and RA-19

World Radiocommunications Conference 2019 (WRC-19)
Further to Resolution 809 (WRC-15), and following Council Resolution 1380 (Modified 2017), the World Radiocommunication Conference 2019 (WRC-19) was held in Sharm el-Sheikh, Egypt from 28 October to 22 November 2019. A total of 3,420 participants representing 163 Member States and 129 observer organizations attended the event.

WRC-19 was a fully paperless conference. To facilitate the handling of the 970 documents containing 5811 proposals issued for the conference, ITU enhanced the use of the Proposals Management System, and further developed the Conference Proposals Interface, both already used in previous ITU conferences. Other electronic tools used during the conference were: the WRC-19 SharePoint, the WRC-19 Smartphone Applications, the Radio Regulations Navigation Tool, and the Sync Application.

As per ITU Information/document access policy, all input documents were freely accessible by the public in advance of the conference. The Final Acts of WRC-19 are also available for public access as they are considered the main output of the conference. Full information on WRC-19 can be found at www.itu.int/go/WRC-19 .

Main outcomes of WRC-19

WRC-19 addressed over 36 topics related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources. The following are WRC-19 key outcomes:

Mobile and fixed broadband communications
Satisfying IMT-2020/5G requirements for millimetre-wave spectrum, WRC-19 identified a total of 17.25 GHz of additional spectrum for IMT in frequencies between 24 GHz and 71 GHz, 86% of which was harmonized on a global basis. The additional frequency bands identified for IMT globally are the 24.25-27.5 GHz, 37-43.5 GHz and 66-71 GHz bands, with regional and country identifications made in the 45.5-47 GHz and 47.2-48.2 GHz bands.

To protect systems in the Earth exploration-satellite service (passive) in 23.6 – 24 GHz, WRC-19 updated Resolution 750 to specify limits of unwanted emission power levels from IMT systems in the 24.25-27.5 GHz band. A two-step approach was established whereby the limit on unwanted emission power levels become even more stringent for IMT systems deployed after 1 September 2027, after which a greater number of IMT systems are anticipated to be in service in that frequency range.

WRC-19 changed the regulatory conditions for wireless access systems, including radio local area networks (WAS/RLANs) in the band 5,150 -5,250 MHz. This decision allows for the use of Wi-Fi devices in trains and cars, highly sought by the automotive and railway industries. It also permits a limited deployment of outdoor WAS/RLANs, with due protection of space services.

Various frequency bands for high altitude platform stations (HAPS) were identified globally, along with other bands in Region 2, for a total of 5.25 GHz spectrum. This will facilitate the development and implementation of HAPS and will enable affordable broadband connectivity and telecommunication services in underserved communities and in rural and remote areas, including mountainous and desert zones, thus connecting the unconnected. HAPS can also be used for disaster recovery communications.

Various bands between 275 and 450 GHz were identified for the land mobile and fixed services, with conditions necessary to protect the Earth-exploration satellite service (EESS) (passive) applications in some of these bands. The identification enables future fixed and mobile systems with data rates of more than 100 Gbit/s. The protection of passive services will require further studies.

Amateur radio service

WRC-19 made allocations to the amateur service on a secondary basis in the frequency band 50-52 MHz in Region 1 (R1), with the conditions to protect the incumbent services. In some R1 countries, the allocation to the amateur service is on a primary basis in the entire band 50-54 MHz or its parts. Through this action, WRC-19 completed harmonization of spectrum throughout the three Regions, since in Regions 2 and 3 the allocation existed before WRC-19. This will enhance radio amateur's capacity to communicate in this frequency band.

Radiocommunications for Transportation Systems

WRC-19 adopted a new Resolution on Railway radiocommunication systems between train and trackside (RSTT). It invites continued development of the ITU-R Recommendations/Report for spectrum harmonization of RSTT. Countries are encouraged, when planning for their RSTT, to consider these study results. This resolution contributes to global and regional harmonization of RSTT applications, enabling economies of scale and interoperability.

WRC-19 also adopted a new Recommendation on Intelligent Transport Systems (ITS) to recommends administrations to consider the harmonized frequency bands, as described in the relevant Recommendations (e.g. ITU-R M.2121), when planning and deploying evolving ITS applications. This recommendation contributes to global and regional harmonization of ITS applications, enabling economies of scale and interoperability.

Enhanced Maritime Communications Systems and Services

NAVDAT (Navigation Data) is a digital system to broadcast maritime safety information, including navigation and meteorological warnings. WRC-19 authorized the usage of NAVDAT in certain medium- and high-frequency bands in the maritime mobile service, which will provide a variety of safety-related information to ships using digital technologies.

WRC-19 adopted the regulatory provisions necessary for adding Iridium as a second satellite provider to the Global Maritime Distress and Safety System (GMDSS). Specifically, allocation to the maritime-mobile satellite service was upgraded in the downlink and entered this band in the Radio regulations (RR) Appendix 15 for GMDSS. Additionally, regulatory provisions were reinforced to protect radio astronomy in the lower adjacent band and the mobile-satellite service in the same band and adjacent upper band. The introduction of this second GMDSS satellite provider, which is a non-geostationary orbit (non-GSO) system, is very beneficial for the maritime community as it allows GMDSS globe coverage, including polar areas, and reinforces competition in the area of maritime communications.

Usage of maritime frequency channels for autonomous maritime radio devices (AMRDs) was regulated by segregating these channels into safety-related and non-safety related groups and limiting access to them accordingly. Safety of navigation at sea is enhanced with this AMRD regulation.

To enable the satellite component of the VHF Data Exchange System (VDES), secondary allocations to the maritime mobile-satellite service were secured. Enabling satellite VDES extended VDES service beyond the coastal areas reached by the terrestrial component (previously approved by WRC-15) to global coverage, allowing for the implementation of a complete VDES concept. This decision enhances VHF communications and improves maritime safety on a global basis.

Global Aeronautical Distress and Safety Systems

WRC-19 considered spectrum needs and regulatory provisions for the introduction and use of the Global Aeronautical Distress and Safety System (GADSS). Based on the results of relevant ITU-R studies, WRC-19 did not make any regulatory changes in the Radio Regulations to accommodate GADSS, since it represents an evolving performance-based system that is difficult to describe in specific regulatory terms.

Satellite Services

WRC-19 adopted a new regulatory framework, including a milestone-based approach for the deployment of non-GSO satellite constellations in specific frequency bands and services. The new milestone-based regulatory framework will enable mega-constellations of satellites - hundreds to thousands of spacecrafts in low-earth orbit - to rapidly come to fruition ensuring the operation of as many systems as possible. The approach will help ensure that the Master International Frequency Register is aligned with the actual deployment of non-GSO satellite systems. In making this decision, WRC-19 struck a balance among the prevention of spectrum warehousing, the proper functioning of coordination, notification and registration mechanisms, and the operational requirements related to the deployment of non-GSO systems.

New orbital slots for broadcasting satellites were opened, providing developing countries with the opportunity to regain access to spectrum orbit resources through a specially designed priority mechanism.

WRC-19 defined the regulatory, operational and technical conditions under which frequency bands in the 30/20 GHz frequency range can be used by earth stations in motion (ESIM) communicating with geostationary-satellite orbit (GSO) space stations in the fixed-satellite service in all Regions. This decision will enable the connection of people on ships (maritime ESIM), aircraft (aeronautical ESIM) and land vehicles (land ESIM) and ensure their safety, security and comfort while in motion. It will also increase the use and further develop ESIMs while protecting other GSO networks and non-GSO systems as well as terrestrial services.

Support for Science Services

WRC-19 established in-band and adjacent band protections for Earth-Exploration Satellite Services (EESS) and Space Radiocommunications Stations (SRS) to ensure that space-based monitoring of the Earth and its atmosphere remain unhindered.

Regulatory and technical measures were approved to protect the long-term development of Data Collection Platforms. Frequency bands in the Space Operation Service and regulatory procedures were defined for introducing satellites with short duration missions, while affording due protection to terrestrial service.

WRC-19 adopted measures to ensure that satellite services supporting meteorology and climatology, which aim to safeguard human life and assess the state of natural resources, will be protected from harmful radio-frequency interference, as will systems used by radio astronomers for deep space exploration. Additional measures were adopted to ensure that radio astronomy stations will be protected from harmful radio interference from other space stations or satellite systems in orbit.

Measures were also adopted to ensure the continuous assistance and support for the timely implementation of new technologies, including 4G and 5G networks and services in Palestine.

Gender Declaration

WRC-19 adopted the "Declaration on Promoting Gender Equality, Equity and Parity in the ITU Radiocommunication Sector", which stated the commitment of the Radiocommunication Sector to gender equality and balance. Further, it declared that ITU Member States and Sector Members should encourage the adoption of proven measures to increase globally the number of women pursuing academic degrees at all levels in STEM fields, particularly those related to the ICT. Member States should also consider the adoption of a Resolution at the 2023 Radiocommunication Assembly on gender equality, equity and parity in the ITU-R.

Agenda for WRC-23 and preliminary agenda for WRC-27

WRC-19 adopted new Resolutions containing the agenda for WRC-23 and the preliminary agenda for WRC-27. The WRC-23 agenda contains 19 specific agenda items on technology development and new spectrum requirements for users in the terrestrial, aeronautical, maritime, satellite or science services. The WRC-23 agenda contains also the usual standing agenda items and will further consider the preliminary agenda for WRC-27. The WRC-23 agenda will be presented in a separate document to Council 2020.

Radiocommunications Assembly (RA-19)

As per Council Resolution 1343, the Radiocommunication Assembly 2019 (RA-19) was held in Sharm el-Sheikh, Egypt, from 21 to 25 October 2019 with 521 participants representing 91 Administrations and 31 Sector Members and 1 specialized agency of the United Nations.

RA-19 was a fully paperless assembly, with all of the detailed drafting activities being conducted using the RA-19 SharePoint web site. A Sync Application was also provided and used. As decided during the opening plenary and in line with the decisions of PP-14, all input documents were freely accessible by the public in advance of the assembly since no Member State considered that their disclosure would cause potential harm to a legitimate private or public interest that outweighs the benefits of accessibility.

The ITU-R Resolutions, Recommendations and Questions are available for public access. Full information on RA-19, including webcast archives, can be found on the webpage. In total, RA-19 revised 23 ITU-R Resolutions.

Resolution ITU-R 1 "Working methods for the Radiocommunication Assembly, the Radiocommunication Study Groups, the Radiocommunication Advisory Group and other groups of the Radiocommunication Sector" and Resolution ITU-R 2 "Conference Preparatory Meeting" were both revised. Since Resolution ITU-R 1 was restructured and significantly updated in RA-15, only minor refinements and clarifications were made during RA-19. Regarding Resolution ITU-R 2, substantial revisions were made to improve the study and reporting process of technical preparations towards the World Radiocommunication Conference (WRC).

The structure of the ITU-R Study Groups was maintained, and the Chair/Vice-Chairs for these Groups were appointed as appropriate. As such, the existing six ITU-R Study Groups continue into the new study period (2019-2023) with the same scopes of activity. The structure of Radiocommunication Study Groups, including their scopes, chairperson and vice-chairperson, can be found in Resolution ITU-R 4.

RA-19 approved the work programme and Questions of the Radiocommunication Study Groups (see Resolution ITU-R 5) as well as five ITU-R Recommendations.

Additionally, two new ITU-R Resolutions were approved, both related to broadcasting issues:

Resolution ITU-R 70 –- Principles for the future development of broadcasting

Resolution ITU-R 71 – Role of the Radiocommunication Sector in the ongoing development of television, sound and multimedia broadcasting

The Assembly also decided to suppress three ITU-R Resolutions:

Resolution ITU-R 34 – Guidelines for the preparation of terms and definitions

Resolution ITU-R 35 – The organization of vocabulary work covering terms and definitions

Resolution ITU-R 43 – Rights of associates

1.2 Spectrum/orbit regulation and management

The ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits, limited natural resources which are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, emergency telecommunications, meteorology, global positioning systems, environmental monitoring and communication services. In implementing this mission, ITU-R creates the conditions for harmonized development and efficient operation of existing and new radiocommunication systems, taking due account of all parties concerned.

ITU also supports developing countries with capacity building related to the management of spectrum. Key outcomes of WRC-19 and RA-19 including frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources are addressed in Section 1.1. Further information on ITU-R is available online.

Results of the processing of space notices and other related activities

	2016	2017	2018	2019	Total 2016-2019
Coordination and notification requests / corresponding number of assignments in unplanned bands	1,267/ 414,865	1,186/ 1'017,489	957/ 887,216	1,174/ 596,504	4,584/ 2'916,074
Requests for broadcasting-satellite and associated feeder links Plans / corresponding number of assignments	100/ 25,484	79/ 45,522	135/ 69,107	73/ 22,314	387/ 162,427
Requests for fixed-satellite service Plan / corresponding number of assignments	84/ 4,087	55/ 1,692	89/ 1,617	51/ 891	279/ 8,287

Results of the processing of terrestrial notices and other related activities in 2019

	2016	2017	2018	2019	Total 2016 – 2019
Notices recorded in the MIFR/Plans	170,044/ 5,812	100,971/ 3,378	79,134/ 2,798	81,602/ 3,690	431,751 15,678
Review of findings for terrestrial stations recorded in the MIFR	0	2,578	244	164	2,986
Notifications of coast and ship stations for recording in the ITU maritime database	2,994	2,865	2,367	2,414	10,640
High-frequency broadcasting requirements	32,818	32,523	31,215	34,344	130,900
Monitoring observations concerning the monitoring programme at 2,850- 28,000 kHz/ and 406-406.1 MHz	48,832/ 163	22,496/ 202	27,908/ 222	30,825/ 253	130,061/ 840
Reports of harmful interference	4,434	1,187	1,096	1,088	7,805

Improvement of ITU-R software

In 2019, the Radiocommunication Bureau (BR) continued to develop software applications and databases to enable efficient and timely processing of notices and to facilitate the use of ITU-R outputs by ITU membership.

Progress in terrestrial services:

- Implementation of the changes in the examination of filings under Radio Regulations (RR) No. **9.19**
- Considerable progress in the Integration of the processing of coordination requests under RR No. **9.21**
- Integration of GE06 software into TerRaSys
- Continuation of the migration from Ingres platform to SQL Server
- Changing platform (to SQL Server) and improvements of the interface for the Maritime mobile Access and Retrieval System (MARS) and International Monitoring Stations

Progress in fulfilling the BR Space Information Systems roadmap (RAG-19, 2012):

- Business Continuity and Disaster Recovery (both Space and Terrestrial Services)
- Rewrite legacy software for technical examination
- Design and develop the BR Space Information System (BR SIS)

Activities for space applications resulted in the following achievements:

- Implementation of Resolution 907 (Rev. WRC-15): Use of modern electronic means of communication for satellite network-related administrative correspondence
- Implementation of the new non-GSO PFD examination software

In 2019 the ITU Development Sector (ITU-D), in coordination with ITU-R, conducted the following additional work to support developing countries with capacity building on issues related with spectrum management:

- *Policy and Regulation Initiative for Digital Africa (PRIDA)*, to foster universally accessible, affordable and effective wireless broadband across the continent. The project held its Kick Off and Technical Committee meeting, as well as a Cross Border Spectrum Management Workshop on 29 to 31 May 2019 in Gaborone -Botswana;
- *ITU Seminar on Radiocommunication Matters for Europe (SRME-19)*, Tirana, Albania, 24-26 June 2019 to discuss the current regulatory framework for international frequency management and provided trainings on use the different tools. The seminar was followed by the Forum on 5G Ecosystem: Challenges and Opportunities;
- *A regional spectrum management training seminar* for the Caribbean was organized (BDT and BR) to improve the level and speed of ICT connectivity in countries within the region; ITU provided 35 Ku band satellite connectivity equipment to seven Pacific Islands countries (Fiji, Kiribati, Papua New Guinea, Samoa, Tonga, Tuvalu, and Vanuatu) where the equipment was deployed to remote areas.

In addition to the previous activities, ITU-D provided specialized assistance to Regions and ITU administrations, as follows:

- Mongolia, to review the national radio frequency spectrum charging regime and amending its national laws on frequencies;
- Solomon Islands and Vanuatu, to develop a national type approval regime for short-range wireless devices;
- more than 15 workshops and trainings to raise awareness and build skills on spectrum management and trainings in Asia-Pacific;
- assistance to the Ministry of Science, Energy and Technology and the Spectrum Management Authority of Jamaica for the development of a national spectrum license framework;
- the third annual CIS region and CEE spectrum management conference and ITU workshop on interference-free communication (Minsk, Belarus);
- a series of workshops and seminars in CIS to discuss the future of television, the mapping of terrestrial broadband infrastructure and services and radiocommunication matters;
- assistance within Korean projects related to spectrum management basics and Spectrum Management System for Developing Countries (SMS4DC);
- SMS4DC Technical training in Vientiane, Lao PDR.

1.3 Standardization

ITU's standardization work comprises telecommunications standards (ITU-T Recommendations) and radiocommunications standards (ITU-R Recommendations).

ITU-T Recommendations

ITU-T Recommendations define how ICT networks operate and interwork. Although these Recommendations have non-mandatory status until they are adopted in national law, the level of compliance is high due to their international applicability and level of quality. Currently, there are over 4,000 Recommendations in force on a broad range of topics including service definition to network architecture and security, broadband DSL to Gbit/s optical transmission systems, next-generation networks (NGN) and IP-related issues. All of these topics constitute the fundamental components of today's ICTs.

During the period covered by this report, ITU approved more than 320 new and revised ITU-T Recommendations. A selection of recent standardization achievements is provided below and executive summaries of ITU-T study group meetings can be found on the homepages of ITU-T study groups.

- *JPEG wins an Emmy*: The engineering team responsible for the first edition of the JPEG image compression standard (T.80-series) was honored with an Emmy Award for its outstanding contribution to image coding;
- *5G transport*: ITU-standardized backbone technologies expected to support 5G systems including Passive Optical Network (PON), Carrier Ethernet and Optical Transport Network (OTN). New Supplements describe the requirements of 5G fronthaul in a PON context (G. Suppl. 66) and the application of OTN to 5G transport (G. Suppl. 67);
- *5G networking*: New ITU standards address network slice orchestration and management (Y.3153) and fixed-mobile convergence, in relation to mobility management (Y.3132) and capability exposure (Y.3133);
- Machine learning for 5G: New ITU standards describe an architectural framework for the integration of machine learning into 5G and future networks (Y.3172), a framework to evaluate intelligence levels across different parts of the network (Y.3173), and a framework for data handling in support of machine learning (Y.3174). These standards will guide contributions to a new ITU Global Challenge on AI and Machine Learning in 5G;
- *Rural broadband*: New ITU standards aim to bring high-speed broadband services to rural communities with lightweight, terabit-capable optical cable that can be deployed on the ground's surface with minimal expense and environmental impact (L.163, L.1700, L.110);
- *Metro networks*: A revision of a key ITU standard (G.698.2) provides for multi-vendor interoperable 100G DWDM coherent line interfaces. The standard interfaces will accelerate industry innovation to achieve greater capacity in metro networks;
- *Fiber to the home*: A new ITU standard serves as a guide to the development to higher speed PON systems, identifying sets of applications that can be addressed by a particular system and defining the requirements for each of those systems (G.9804.1);
- *Visible light communication*: A new ITU standard (G.9991) for high-speed indoor 'visible light communication' (VLC), also known as 'LiFi', establishes the foundations for the growth of the VLC market. The standard is fundamental to the collaboration of the connectivity and lighting industries;
- Video coding: Version 7 of High Efficiency Video Coding (HEVC, published as ITU-T H.265 | ISO/IEC 23008-2) has been released. The Versatile Video Coding project, developing the successor of HEVC, is on course for completion by mid-2020;
- *Digital health*: Updated ITU standards developed in cooperation with the Personal Connected Health Alliance provide for medical-grade e-health devices such as blood pressure cuffs, glucose monitors and a wide range of activity trackers (H.810-series). A new ITU standard

provides characteristics of personal sound amplifiers in support of ITU-WHO collaboration for safe listening (H.871);

- *Quantum information technology*: New ITU standards describe the networking concepts to underpin quantum key distribution, a means of enabling secure encryption and authentication (Y.3800), and the architecture of a quantum noise random number generator (X.1702);
- *Distributed ledger technology*: New ITU standards address the requirements of blockchain in next-generation network evolution (Y.2342) and the security requirements of blockchain, both in terms of blockchain's security capabilities and security threats to blockchain (X.1401);
- *Strong authentication*: Two new ITU standards (X.1277 and X.1278) aim to overcome the security limitations of passwords, addressing biometric authentication on mobile devices and the use of external authenticators, such as mobile devices, to authenticate Web users. The specifications were submitted to ITU by the FIDO Alliance ('Fast Identity Online');
- *Environment and circular economy*: New ITU standards provide criteria for the evaluation of the environmental impact of mobile phones (L.1015), guidelines and certification schemes for e-waste recyclers (L.1032), definitions and concepts relevant to material efficiency in the ICT sector (L.1022), and a methodology to assess the positive impacts of ICTs on the environmental efficiency of other industry sectors (L.1451);
- *Climate change*: A new ITU standard (L.1470) highlights that compliance with the UNFCCC Paris Agreement. More details are provided in Section 1.5;
- *Energy efficiency*: New ITU standards aim to support sustainable power feeding solutions for 5G networks (L.1210), energy-efficient datacentres capitalizing on big data and AI (L.1305), and smart energy management for telecom base stations (L.1380);
- *Internet of Things (IoT)*: New ITU standards address IoT-based smart residential communities (Y.4556) and the accessibility of Internet of Things applications and services to persons with disabilities (Y.4204);
- Smart sustainable cities and communities: A new ITU standard puts forward a maturity model for smart sustainable cities, enabling the examination of a city's progress towards smart city objectives (Y.4904). More details are provided in Section 1.5;
- *Voice quality*: New ITU standards address the relationship between voice QoS and 4G circuit-switched fallback (G.1028.2) and best practices for the measurement of QoS in mobile networks (E.806). A revised ITU standard details the factors influencing end-to-end QoS for 4G voice (G.1028). The E-Model (G.107), supporting high-quality voice, now addresses both wideband (50-7,000 Hz: G.107.1) and fullband (20-20,000 Hz: G.107.2);
- *Regulatory frameworks for quality of service/experience (QoS/QoE)*: A new ITU standard provides guidance to regulators aiming to establish national or regional regulatory frameworks to monitor and measure QoS and QoE (E.805);
- *Digital financial services*: New ITU standards introduce QoS and QoE aspects of digital financial services (G.1033) and a methodology to test the QoE of digital financial services (P.1502);
- *IP performance measurement*: A revision of the ITU standard on IP service performance (Y.1540) reflects changes in the design of IP services and the protocols employed by end-users. The latest edition of the standard defines IP-layer capacity parameters in ways that cater to performance assessment, and provides requirements for methods of measurement of IP-layer capacity;
- *Economic and policy issues*: Three new ITU standards address economic and policy issues relevant to international communications, in particular the relationship between network operators and providers of over-the-top applications (D.262), competition in mobile financial

services (D.263), and principles for a unified format of price/tariffs/rates-lists used for exchanging telephone traffic (D.198);

- *Combatting counterfeiting*: A new ITU standard describes a framework for solutions to combat counterfeit ICT devices, providing the reference framework and requirements to be considered when deploying solutions to combat the circulation and use of counterfeit ICT devices (Q.5050);
- *Content delivery and edge computing*: New ITU standards provide requirements for content delivery networks enabled by mobile edge computing (F.743.10) and mobile edge computing enabled by civilian unmanned aerial vehicles (F.749.11);
- *Premium cable networks*: A new ITU standard provides the framework for a premium cable network platform to support industry in offering advanced multimedia services (J.1600). It is the first of a new series of ITU standards on AI-assisted cable networks;

The inclusivity of the ITU standardization platform is supported by ITU's Bridging the Standardization Gap programme. Open platforms – such as ITU-T focus groups and collaboration initiatives like the AI for Good Global Summit (see description in Section 1.1), the Financial Inclusion Global Initiative (see Annex 1, Resolution 204) or the United for Smart Sustainable Cities Initiative – support the development of new partnerships in emerging fields of ICT innovation and assist in clarifying the contributions expected of ITU standardization.

The World Telecommunication and Information Society Day (WTIDS) took place in 2019 under the theme "Bridging the Standardization Gap". More details can be found in Section 1.11.

ITU-R Recommendations

The ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits, limited natural resources which are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, emergency telecommunications, meteorology, global positioning systems, environmental monitoring and communication services.

The main activities related to spectrum and orbit regulation and management are can be found throughout this document as follows. Section 1.1 above contains key outcomes of WRC-19 and RA-19. This section encompasses the results of the processing of space and terrestrial notices, the software developments and capacity building events to support developing countries. Additional capacity building events can be found under Section 1.10. The output of the standardization work that takes place within ITU-R Study Groups and the ITU-R Recommendations approved in 2019 are listed under Section 1.3. Section 1.4 contains AI activities related to radiocommunications; Section 1.9 lists some of partner organizations of the ITU-R and finally Section 2.1 lists the results of the Radio Regulations Board (RRB) and of the Technical Assistances provided by the BR.

Working Parties (WP)	New or Revised ITU-R Recommendations
WP 1A - Spectrum engineering techniques	SM.1138-3, SM.1448-1, SM.2110-1, SM.2129-0
WP 1C - Spectrum monitoring	SM.1054-1, SM.1268-5, SM.1875-3
WP 3J - Propagation fundamentals	P.310-10, P.341-7, P.453-14, P.525-4, P.526-15, P.527-5, P.676-12, P.840-8, P.841-6, P.1057-6, P.1407-7, P.1511-2, P.1853-2
WP 3K - Point-to-area propagation	P.528-4, P.1238-10, P.1411-10, P.1546-6, P.1812-5, P.1816-4, P.2109-1
WP 3L - Ionospheric propagation and radio noise	P.372-14, P.531-14, P.533-14
WP 3M - Point-to-point and Earth-space propagation	P.617-5, P.619-4, P.681-11, P.1144-10, P.2001-3
WP 4A - Efficient orbit/spectrum utilization for FSS and BSS	S.1782-1
WP 4B - Systems, air interfaces, performance and availability objectives for FSS, BSS and MSS, including IP-based applications and satellite news gathering	S.2131-0
WP 4C - Efficient orbit/spectrum utilization for MSS and RDSS	M.1901-2, M.1902-1, M.1903-1, M.1904-1, M.1905-1
WP 5A - Land mobile service above 30 MHz* (excluding IMT); wireless access in the fixed service; amateur and amateur-satellite services	M.1746-1, M.1808-1, M.1826-1, M.2084-1, M.2134-0
WP 5B - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service	M.585-8, M.1174-4, M.2135-0
WP 5C - Fixed wireless systems; HF and other systems below 30 MHz in the fixed and land mobile services	F.387-13, F.636-5, F.758-7, F.1565-1
WP 5D - IMT Systems	M.1036-6, M.2012-4
WP 6A - Terrestrial broadcasting delivery	BS.450-4, BS.1114-11, BS.1660-8, BT.1877-2, BT.2036-3
WP 6B - Broadcast service assembly and access	BS.1196-8, BS.1548-7, BS.2076-2, BS.2088-1, BS.2126-0, BS.2127-0, BT.1872-3, BT.2133-0
WP 6C - Programme production and quality assessment	BS.1283-2, BS.2132-0, BT.500-14, BT.1702-2, BT.2111-1
WP 7B - Space radiocommunication applications: Systems for transmission/reception of telecommand, tracking and telemetry data for space operation, space research, earth exploration-satellite, and meteorological satellite services	SA.1016-1, SA.1027-6, SA.1161-3, SA.1164-4

1.4 Emerging technologies

ITU monitors the progress of new/emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), and Quantum information Technologies (QIT).

Artificial Intelligence

In recent years, AI has been advancing at an exponential pace. Artificially intelligent machines are able to sift through and interpret massive amounts of data from various sources to carry out a wide range of tasks. For example, AI's ability to analyse high-resolution images from satellites, drones or medical scans can improve responses to humanitarian emergencies, increase agricultural productivity, and help doctors identify skin cancer and other illnesses. The transformative power of AI, however, also comes with challenges, ranging from issues of transparency, trust and security, to concerns about displacing jobs and exacerbating inequalities.
This section lists some of the ITU groups and activities working in the area of Artificial Intelligence. More details are available on the recently published intersectoral website on ITU's activities in AI - available here.

AI for Good Global Summit: See section 1.11.

AI related Focus Groups:
Several AI-related FGs have been established / working through this year. For example, ITU-T Focus Group on Machine Learning for Future Networks (FG-ML5G) including 5G (meeting the 17-18 March 2020), the ITU-T Focus Group on AI for Health (FG-AI4H) (virtual meeting 6-8 May 2020), the ITU-T Focus Group on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (FG-AI4EE), and the ITU-T Focus Group on AI for autonomous and assisted driving (FG-AI4AD) (First meeting was held on 21-22 January 2020 in London, United Kingdom).

AI and Emerging Radiocommunications Technologies:
AI acts as an enabler to enhance emerging radio technologies, as demonstrated by, for example, AI and IMT-2020 (5G), AI and IoT, AI and Cognitive Radio Systems (CRS), AI and Satellite Ecosystem, AI and Spectrum Monitoring, AI and Intelligent Transport Systems (ITS).

AI in radiocommunications:
This section summarizes the main questions currently under study in ITU-R study groups, as well as reports under elaboration, on issues related with the use of AI in radiocommunications:

- The scope of ITU-R Study Group 1 covers all aspects of Spectrum Management, including Spectrum Monitoring. With respect to artificial intelligence techniques such as machine learning, Question ITU-R 241/1 "Methodologies for assessing or predicting spectrum availability" was approved in 2019 and is under study
- The scope of ITU-R Study Group 6 covers all the aspects from production to reception for the broadcasting service. ITU-R SG 6 deliverables and work items related to artificial intelligence and machine learning are as follows:
    - Question ITU-R 144/6 "Use of Artificial Intelligence (AI) for broadcasting" focuses on the impact of AI technology and how can it be deployed to increase efficiency in the areas of programme production, quality evaluation, programme assembly and for broadcast emission.
    - Report ITU-R BT.2447 "Artificial intelligence systems for programme production and exchange", discusses current applications and efforts underway and evaluated those that are relevant to the near-term broadcast programme and production pathway.

A number of related ITU-R Reports and Recommendations are available online.

Internet of things (IoT)

ITU enables the coordinated development of interoperable IoT technologies, essentially, millions of connected devices and objects. During the year covered by this report ITU's work on the IoT included, but is not limited to, the approval by ITU-T SG20 of 13 IoT-related Recommendations. Some examples include the following:

- ITU-T Y.4208 IoT requirements for support of edge computing; ITU-T Y.4556 Requirements and functional architecture of smart residential community, ITU-T Y.4459 Digital entity architecture for IoT interoperability, ITU-T Y.4461 Framework of open data in smart cities, ITU-T Y.4462 Requirements and functional architecture of open IoT identity correlation service, ITU-T Y.4464 Framework of blockchain of things as decentralized service platform, ITU-T Y.4466 Framework of smart greenhouse service, ITU-T Y.4467 Minimum set of data structure for automotive emergency response system, and ITU-T Y.4904 Smart sustainable cities maturity model;
- The standardization of Internet of Things (IoT) test specifications is accelerating, supported by the increasing collaboration of ITU-T and oneM2M. See above mentioned work by ITU-R on AI and IoT.

For details, see Annex 1, Resolution 197.

Quantum Information Technology (QIT)

QIT is a class of emerging technology that improves information processing capability by harnessing principles of quantum mechanics. It has promoted the booming of the second quantum revolution and will have a profound impact on ICT networks.

In response to this new emerging technology ITU established the ITU-T Focus Group on Quantum Information Technology for Networks (FG-QIT4N) to provide a collaborative platform for pre-standardization aspects of QIT for networks. Its main objectives are: to study the evolution and applications of QIT for networks; to focus on terminology and use cases for QIT for networks; to provide necessary technical background information and collaborative conditions to effectively support QIN-related standardization work in ITU-T Study Groups; and to provide an open cooperation platform with ITU-T Study Groups and other SDOs. Section 1.3 summarizes some of the first ITU recommendations related to QIT already adopted.

Details on **other emerging technologies** (e.g. distributed ledger technology and digital financial services) can be found in section 1.3 and in Annex 1, Resolution 204.

WTPF-21

Preparation for WTPF-21 are underway. By Decision 611 (Council 2019), ITU Council decided the theme for WTPF-21 as: *"Policies for mobilizing new and emerging telecommunications/ICTs for sustainable development."* and will discuss how new and emerging digital technologies and trends are enablers of the global transition to the digital economy. Themes for consideration include AI, IoT, 5G, Big Data, OTTs etc. In this regard, the WTPF-21 will focus on opportunities, challenges and policies to foster sustainable development.

All documents related to the preparatory process are available on the Informal Expert Group website.

1.5 Environment and Smart Sustainable Cities and Communities

ICTs provide a growing amount of opportunities for sustainable development and to address challenges related to climate change. ICTs are fundamental for monitoring, mitigating and adapting to the effects of climate change. ICTs also deliver smart applications and transform the way services are delivered - including in the area of energy, waste, and water management - to reduce the carbon footprint of human activities. At the same time, it is important to address the environmental challenges that the ICT industry presents. A growing information society increases the level of energy consumption and the emission of greenhouse gases (GHGs) for the growing spread and use of ICT services, networks and devices. The volume of e-waste is on the rise and it contains hazardous substances that, if treated inadequately, can cause severe environmental and human health impacts.

This section presents an overview of some of the activities conducted by ITU on areas related to environment and smart sustainable cities and communities. Further details on activities relating to the environment are available online. See also Annex 1, Resolution 197.

Climate change

ITU-R SG 7 (Science services) continued its work in the development of recommendations for remote sensing systems and space applications. ITU-T SG5 (environment, climate change and circular economy) continued to develop recommendations and leverage global expertise to solve urgent issues related to e-waste, circular economy and climate change. ITU developed a new standard (Recommendation ITU-T L.1470) and guidance setting concrete guidelines for the ICT industry to reduce greenhouse gas (GHG) emissions by 45% from 2020 to 2030, aligned with science-based targets necessary to achieve the Paris Agreement in collaboration with the Global Enabling Sustainability Initiative (GeSI), GSMA and SBTi.

ITU-D Study Group Question 6/2 on ICTs and the Environment continued to undertake studies on ICTs and climate change and how ICTs can help to adapt to the effects of climate change.

ITU participated in the annual Conference of the Parties (COP 25) to the UNFCCC celebrated in Madrid, Spain, contributing to the UN side events and exhibits on synergies between SDG 11 and 13, well as to the UN system Climate Change Library with updated ITU related publications. The new publication "Turning digital technology innovation into climate action", launched by ITU in September 2019, outlines the potential of digital technologies for monitoring, mitigating and adapting to climate change.

Energy efficiency and smart sustainable cities and communities

ITU is working to improve the reliability, security and interoperability of ICT infrastructure needed for smart sustainable cities and communities, while at the same time advocating for the use of ICTs to reduce the consumption of energy and enhance services and quality of life for city dwellers.

ITU-T SG20 (Internet of Things, smart cities and communities) developed a series of recommendations to address the standardization requirements of IoT technologies, with a focus on IoT applications and challenges in smart cities and communities (see Section 1.3). A new focus group on environmental efficiency for artificial intelligence (AI) and other emerging technologies (FG-AI4EE) was established (see Section 1.4). The U4SSC (United for Smart Sustainable Cities) initiative continued to advocate public policy to encourage the use of digital technologies toward facilitating and easing the transition to smart sustainable cities and communities through its 11 thematic groups and its U4SSC implementation programme. The 9th Green Standards week took place in Valencia, Spain. The 1st Digital African Week took place in Abuja, Nigeria. An Arab regional initiative on IoT and Smart cities

raised awareness on the wide scale deployment of Internet of Things to establish Smart Cities and societies in the Arab region.

E-waste

ITU has a broad portfolio of activities in the area of e-waste and strives to tackle the challenges faced by this waste stream at the global, regional and national level. It focusses on a number of priorities in the area of e-waste, from conducting life-cycle analysis of products and processes, helping shift current economic models to a green and circular economy for ICT equipment, supporting policy and regulatory development, producing standards, improving and collecting worldwide e-waste data and helping raise awareness, globally, in order to make encourage accountability.

During this year, ITU's work continued towards meeting the e-waste targets established by the Connect 2030 agenda. The international e-waste day took place in October 2019. Further new entities signed up to join the UN e-waste coalition, paving the way for greater e-waste management collaboration. ITU and other partners worked together on a Global Environmental Facility (GEF) funded project in Latin America. The e-waste monitor in Arab region generated e-waste data set for the 22 Arab countries and enhanced skills on e-waste collection and statistics methods and tools. A new Massive Open Online Course (MOOC) on e-waste management developed with Basel Convention, WHO and other partners was launched in February 2019.

Policy awareness workshop on E-waste in Hyderabad, India from 27-29 November 2019 helped create inter-ministerial and departmental linkages for programmatic collaboration on e-waste including roles and responsibilities and the identification of funding gaps and budget sources.

Emergency Telecommunications

In 2019, ITU launched new Guidelines for the development and implementation of National Emergency Telecommunication Plans.

To bolster preparedness and reduce vulnerability of countries, ITU and the Emergency Telecommunications Cluster (ETC), jointly developed in 2019 the Table-Top Simulation Guide which will allow stakeholders to test and refine emergency telecommunication plans and policies to verify whether networks, redundant communications capacities and capabilities, personnel, and other telecommunication systems are in place.

In 2019, ITU assisted Mozambique, the Solomon Islands, Fiji, and Zimbabwe and the Bahamas, deploying satellite phones and network equipment in disaster strike countries.

The report Disruptive technologies and their use in disaster risk reduction and management (2019) discusses the use and opportunities of ICTs and disruptive technologies for disaster risk reduction and management. The document finds that technological advancement and innovation are creating new opportunities for enhancing disaster resiliency and risk reduction. Developments in disruptive technologies – such as AI, IoT and Big Data – and innovations in such areas as robotics and drone technology are transforming many fields, including disaster risk reduction and management.

1.6 Cybersecurity: building confidence & security in ICTs

The main objective related to ITU's activities in the area of Cybersecurity is to deliver products and services to help ITU membership build confidence and security in the use of telecommunications/ICTs, as well as to contribute to the implementation of national and global initiatives. These activities are built on Resolution 130 (Rev. Dubai, 2018), Resolution 174 (Rev. Busan, 2014) and Resolution 179 (Rev. Dubai, 2018), and related resolutions from the WTDC and the WTSA, as well as from ITU's role as sole facilitator for WSIS Action Line C5. The ITU Cybersecurity Programme and its priorities, shows the complementary nature and facilitates the implementation of ITU-R, ITU-T and ITU-D activities in this domain.

Legal Measures

Legal measures are needed to assure an appropriate cybersecurity legislation and harmonization of the legal and policy framework. During this period, ITU-D has continued to assist Member States in understanding the legal aspects of cybersecurity, through the Guide to Develop a National Cybersecurity Strategy (NCS) and the Cybercrime Legislation Resources, where ITU collaborates closely with partners such as United Nations Office on Drugs and Crime (UNODC) and other experts.

Technical and Procedural Measures

Regarding the standardization process, ITU-T SG17 (Security) is the lead study group on building confidence and security in the use of ICTs. ITU-T SG17 continues to facilitate more secure network infrastructure, services and applications, and coordinates security-related work across all ITU-T Study Groups. SG17 has established 25 new work items and more than 30 new or revised ITU-T Recommendations, under the X Series Recommendations. SG17 was also the first study group to celebrate a fully virtual meeting on 17-26 March 2020.

Other ITU-T Study Groups, such as ITU-T SG9 (Broadband cable and TV) and ITU-T SG13 (Future networks, with focus on IMT-2020, cloud computing and trusted network infrastructures, contributed during this period to achieving ITU mandate on cybersecurity. See further details in Section 1.3.

Also ITU-R worked in establishing clear security principles for IMT (3G, 4G and 5G) networks. See ITU-R Recommendations and Section 1.3.

Organizational Structures

ITU-D works on technical assessments to evaluate the preparedness of and to equip ITU Member States with a fully functioning/operational National Computer Incident Response Teams (CIRTs). Direct engagement in 14 such activities had been completed, including the following countries: Kiribati, Solomon Islands, Papua New Guinea, Vanuatu and the State of Palestine. There are also on-going activities such as four CIRT projects initiated and being implemented in Botswana, Burundi, Gambia, and Malawi. In Kenya the existing CIRT enhancement is planned to be completed by 2020. CIRT readiness assessment workshops were conducted in Chad and Liberia. The national CIRT stakeholders of Gambia were trained on CIRT operations.

Capacity Building

ITU works to enhance national cybersecurity and reduce the knowledge gap. Some activities during this period were:

- Regional cybersecurity forums organized for all ITU regions in order to build capacity for different ITU-D programmes/activities and provide an operational platform for regional and international cooperation;

- Workshops took place in Indonesia; Macedonia -addressed to Balkan States-; and Tunisia, for countries from the Africa and Arab States regions. The ITU Guide to Developing a National Cybersecurity Strategy (NCS) constitutes a good practice that was used and promoted;
- Capacity development and technical assistance was provided to Sudan to improve its strategy on critical information infrastructure protection;
- Regional Cyber Security Weeks were celebrated in the Arab States, organized by the ITU Arab Regional Cyber Security Centre (ITU-ARCC). The Moldova Cybersecurity Week was held in Chisinau;
- A Cyber Shield 2019 was held in Turkey, to increase incident response capabilities and readiness levels, as well as the mutual understanding of cyber risks and associated impacts, and to ensure a continued collaborative effort among international cybersecurity stakeholders especially national CIRTs in order to mitigate cyber threats;
- A training session for Kyrgyzstan on how to set up a cybersecurity operations center;
- Cyberdrills – which had already involved more than 100 countries – were organized in Uganda (Africa Region, Nov 2019); Oman (Arab Region, Oct 2019); and Malaysia (Asia & the Pacific Region, Sept 2019); and
- ITU-T SG17 organized a one-day ITU Workshop on Fintech Security (Aug 2019) which resulted on the follow-up of activities in collaboration with ITU FGs (FG-DLT, FG-DFC) and other identified Fintech security-related SDOs, i.e., ISO TC 307, W3C on DLT. This event took place together with a Mini Workshop on Cybersecurity Challenges in Automated Driving in cooperation with ITU CITS and UNECE WP29.

As a result of this efforts, the third ITU Global Cybersecurity Index (GCI) shows considerable improvement in commitment to cybersecurity worldwide. The fourth version of the Global Cybersecurity Index survey, with an improved questionnaire and methodology (Method for GCI v4), is under preparation.

International Cooperation

To strengthen collaboration, ITU is developing partnerships on cybersecurity-related matters with various regional/international organizations and initiatives. Section 1.9 provides details on ITU Strategic partnerships.

Following the instructions of the 2019 session of Council, the Secretary-General has submitted to the 2020 session of Council (1) a report explaining how the ITU is currently utilizing the GCA framework and (2) with the involvement of Member States, appropriate guidelines developed for utilization of the GCA by the ITU for Council's consideration and approval

As the lead facilitator for WSIS Action Line C5, ITU organized several sessions at the WSIS Forum 2019, including a high-level session on AI and trust, as well as a session on the importance of measurement in cybersecurity.

A multi-stakeholder expert working group, consisting of more than 50 organizations and individual experts, started the review of the Child Online Protection (COP) Guidelines, which were first issued in 2009.

Child Online Protection (COP)

In 2019, a COP Regional Forum was held in Ghana. In the Asia-Pacific region, assistance was provided for the development of the ASEAN Regional Framework, build upon the COP Guidelines, and in coordination with other partners, including such as TELSOM/TELMIN. Other activities took place in Europe, as part of the regional initiative on enhancing trust and confidence in the use of ICTs.

The Broadband Commission for Sustainable Development, co-chaired by ITU, released a comprehensive report issued by the Working Group on Child Online Safety in October 2019. The COP Guidelines were included as a reference and taken as the basis to implement the recommendations of the report.

Further details on ITU's activities related to Cybersecurity are available in document C20/18.

1.7 Digital Inclusion

As accelerators and amplifiers of change, ICTs have the potential to quickly and radically improve people's lives. They facilitate access to information and knowledge, simplify the delivery of essential services and enable social and economic participation. ICTs, however, are not always equally accessible to everyone. Digital inclusion means ensuring all people have an equal opportunity to become empowered through ICTs and be part of digital society. To achieve this, ICTs need to be accessible to all, regardless of their gender, age, ability and location.

ITU has several targeted efforts to bridge the digital divide and advance the Connect 2030 Agenda. See actual measurement of progress towards those targets in Section 3.1.2, for example target 2.8 on gender equality on line to be achieved by 2023.

Gender

ITU is custodian of three gender-related SDG Indicators: proportion of individuals who (1) own a mobile phone, (2) use the Internet, and (2) have ICT skills. Latest figures as published in ITU's Measuring digital development: Facts and figures 2019 shows the digital gender gap is growing, and calls for more effective action to address cultural, financial and skills-related barriers that impede Internet uptake, especially among women.

ITU's work in addressing the digital gender divide include International Girls in ICT Day, an advocacy campaign that started in 2011 to encourage more girls and young women to take up ICT careers and studies. Celebrated annually on the 4th Thursday of April, the day is now a UN observance. In 2019, ITU-led activities were taken "on the road" to Addis Ababa, Ethiopia (see highlights video).

The African Girls Can Code initiative (AGCCI) trains and empowers girls and young women across Africa to become computer programmers, creators and designers. Stemming from its success, an Americas Girls Can Code initiative started in 2019 and engaged 300 girls in coding through a series of workshops.

EQUALS: The Global Partnership to Bridge the Gender Digital Divide also works to address the digital gender divide, focusing on access, skills, leadership and research. In 2019 there was a special focus on EQUALS Entrepreneurs at ITU Telecom World in Budapest Hungary. Further information on the partnership in section 1.9.

Encouraging and tracking gender-balanced representation and nominations of women for key roles strengthens womens' participation in ITU meetings and conferences. The Network of Women for WRC-19 (#NOW4WRC19) efforts culminated in a Declaration on Promoting Gender Equality, Equity and Parity in the ITU Radiocommunication Sector adopted at WRC-19 in Sharm El-Sheikh. See section 1.1.

ITU's gender equality and mainstreaming efforts are reported annually to the United Nations system-wide action plan for gender equality and mainstreaming (UN-SWAP) based on 17 performance indicators. In 2018, ITU "met" or "exceeded" requirements for 5 out of 17 UN-SWAP2.0 indicators, with 2019 improvements including gender-responsive performance management.

Further detail is available in document C20/06 on resolution 70, and online.

Youth

ITU's work on empowering youth through ICTs include the International Girls in ICT Day as well as the Digital Skills for Jobs for Campaign and the ITU Digital Skills Toolkit. Consultations with youth on how to enhance their digital skills were held during the AfriLab gathering in Addis Ababa, Ethiopia, in November 2019, an ITU-ILO event aimed at boosting decent jobs and enhancing digital skills for youth in Africa's digital economy.

The Futurecasters Global Young Visionaries Summit took place in Geneva from 8 to 10 January and was hosted and co-organized by ITU and the Model UN Programme of Ferney-Voltaire, France.

Related to youth, ITU is strengthening its work with academic institutions. ITU currently has some 160 Academia members and the ICT Discoveries journal, as well as the ITU Kaleidoscope Academic Conferences that increase ICT standardization dialogue with academia. Young authors of up to 30 years of age with accepted papers received Young Author Recognition certificates at Kaleidoscope 2019. See Section 1.11 for more details.

Section 1.9 gives details on GIGA, a joint UNICEF and ITU global initiative to connect every school to the Internet and every young person to information, opportunity and choice.

ITU's Focus Group on Machine Learning for Future Networks including 5G (FG ML5G) ran a pilot project to engage university students in FG ML5G's work and expose students to standardization work. ITU experts mentored students and those with completed projects submitted their contributions to FG ML5G.

Further detail is available online.

Accessibility

ITU has advanced in the implementation of Resolution 175 (Rev. Dubai, 2018) focusing in two areas of work: (a) Promoting ICT accessibility for persons with disabilities; and (b) making ITU a more accessible organization for persons with disabilities.

In the first area, ITU has continued conducting technical work in ITU-R, ITU-T and ITU-D study groups, all of which contain relevant questions advancing the use of telecommunications and ICTs for persons with disabilities. This work has been conducted with the participation of persons with disabilities. In addition to this work, ITU has continued to develop toolkits and resources to support ITU Member States to advance in the establishment of enabling environments ensuring accessible telecommunication/ICT for persons with disabilities, in line with the Connect 2030 agenda.

ITU-D has also advanced the implementation of regional initiatives linked to ICT accessibility in the Arab ARB, EUR and CIS regions, each with a range of projects, trainings and events, as well as support to ITU administrations in almost every region, including the organization of the series of Accessible Americas events, continued in 2019, and the second edition of the Accessible Europe series of events.

Within the second area, ITU has continued to advance in the implementation of its ITU Accessibility Policy, endorsed by ITU Council 2013. During 2019 ITU has continued to provide captioning in a broad selection of ITU events and major conferences, sign language interpretation in selected ITU-T accessibility meetings and making ITU websites accessible. ITU has also modified its internal production system to generate accessible publications in the six official languages.

An important development that took place in 2019 was the adoption of the new UN Disability Inclusion Strategy (UN DIS), which incorporated significant inputs from ITU. For 2020 ITU will be expected to report on the implementation of this strategy and review accordingly its Accessibility Policy to adjust to the new framework provided at UN system level.

Further information is available online.

Indigenous People

To empower indigenous people and communities through technology, capacity-building trainings for indigenous communities, tailored to their specific needs and topics of interest, were organized. These trainings take into account self-sustainability aspects and cultural legacy.

1.8 COVID-19 related activities/responses

Coronavirus disease (COVID-19) has plunged the world into an unprecedented crisis, with billions confined to their homes worldwide, now relying on information and communication technology (ICT) for continued access to education, healthcare, work and essential goods and services. From teleworking and e-commerce to telemedicine and remote learning, COVID-19 is the first pandemic in human history where ICT and social media are being used on a massive scale, driving the global collective response to the disease and digital transformation across the world.

The COVID-19 crisis we are in today highlights the fundamental importance of ICT to economies and societies everywhere. It also calls for solidarity, as too many people around the word are still unconnected, left to fend for themselves in these very difficult and uncertain times. In response, ITUhas called on the global ICT community and others to rise to the challenge and strengthen the multilateral, collective digital response to COVID-19.

Equipping policy-makers and regulators

Never before have telecommunication networks been so vital to our health and safety, and to keep our economy and society working. ITU has launched the Global Network Resiliency Platform (REG4COVID). Its goal is simple: to help policy-makers, regulators, and industry players ensure that networks are kept resilient and telecom services are available to all, to the maximum extent possible.

Igniting global action

ITU was instrumental in the adoption of the **Broadband Commission Agenda for Action**, which outlines immediate measures that governments, industry, the international community, and civil

society can take to shore-up digital networks, strengthen capacity at critical connectivity points like hospitals and transport hubs, and boost digital access and inclusivity. The Agenda serves as a framework for the Commission's 50+ Commissioners and their organizations to share their own initiatives, make new commitments, and foster collaboration and partnership to help accelerate the collective response to COVID-19 and lay the groundwork for a better and faster recovery.

Collaborating for a united response

ITU and the office of the UN Under Secretary-General Fabrizio Hochschild have been co-organizing a series of webinars on "Digital Cooperation during COVID19 and beyond." The webinar series focuses on how to secure safe, stable, affordable and inclusive connectivity in this time of crisis and helps identify possible solutions and common approaches and strategies from different nations and stakeholders.

Preparing emergency telecommunications

ITU has launched new guidelines to assist countries in developing national emergency telecommunication plans because the speed and efficiency of response efforts is proportional to the level of preparedness, in the face of COVID-19 as in any other emergency. ITU also recognizes the value of the Amateur Radio Services for working with emergency services to provide essential communication links in times of crisis, linking responders with those in need of humanitarian assistance or helping to keep supply chains open.

Supporting health solutions

ITU, WHO and UNICEF are working with telecommunication companies to text people directly on their mobile phones with vital health messaging to help protect them from COVID-19. These text messages are to reach billions of people that are not able to connect to the internet for information. WHO and ITU are also reviewing how frontier technologies such as artificial intelligence and big data can be leveraged to diagnose, contain, and predict future outbreaks. The ITU Smart Villages platform is used to establish interactive voice services on COVID-19 for everyone in Niger.

Harnessing artificial intelligence

ITU is drawing upon expertise from the AI for Good Global Summit community and has launched an AI for Good Webinar Series delving into promising use cases of artificial intelligence in healthcare and other global challenges. The first few episodes in this series focus on global pandemic response and how AI and ICT can be used to combat COVID-19.

Exploring responses by smart cities

Cities house over half of the world's population and risk amplifying the COVID-19 pandemic. The United for Smart Sustainable Cities (U4SSC) – a UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by other 14 UN bodies – has created a new workstream exploring the solutions and best practices used by cities to address COVID-19.

Protecting children online

For parents and educators, ensuring children's online safety has become more pressing than ever before. ITU has issued *Guidelines for Parents, Carers, Guardians, and Educators for Child Online*

Protection to help minimize online risks. Together with a range of partners, from the Global Partnership to End Violence Against Children, UNESCO, UNICEF, UNODC, the WePROTECT Global Alliance and WHO to the World Childhood Foundation USA, ITU has released a technical note to help governments, ICT companies, educators and parents protect children in lockdown. ITU has also supported the e-safety commission of Australia to promote the Global Online Safety Advice for Parents & Carers- COVID-19.

Enabling learning and education

ITU has joined the COVID-19 Global Education Coalition led by UNESCO to ensure that learning continues for the more than 1.5 billion students and youth across the planet affected by school and university closures. And because children must have equal access to learning, ITU is offering a free-of-charge programme through its Digital Transformation Centres Initiative that provides trainers with tools and skills on how to conduct remote teaching.

Virtual WSIS TalkX

Launched at the request of WSIS Stakeholders, the **Virtual WSIS TalkX** series connects all Stakeholders, facilitates partnerships and coordinates, especially in these challenging times.

The TalkX focus on content generated by WSIS Stakeholders highlighting their response to COVID-19 using ICTs with the hope that these discussions lead to real partnerships and implementation on the ground.

WSIS Stocktaking COVID-19 Response – ICT Case Repository

As a part of the WSIS Stocktaking efforts to promote the innovative use of ICTs in making social impact, and in order to provide useful, deployable and actionable information to all WSIS community and beyond, the ICT Case Repository is now available for collecting projects and activities on how ICTs are assisting stakeholders in their everyday life, work, and in combating challenges caused by this extraordinary situation.

Leading digital transformation by example

Following the announcement of COVID-19 as a pandemic on 11 March 2020, the Crisis Management Team of ITU decided to suspend all physical meetings at ITU Headquarters in Geneva for as long as necessary and transition work to virtual platforms. Since then, ITU has held the first-ever virtual Radio Regulations Board (RRB) meeting with full interpretation in English, French, and Russian; as well as several Study Group and Working Party meetings. The transition to the virtual sphere demanded rapid behavioural change and ITU Members have embraced this change with impressive resolve.

In these challenging times, working tirelessly to better serve our members and respond to the COVID-19 crisis, ITU is committed to continuing to leverage information and communication technology to make the world safer, stronger, and more connected.

All ITU's COVID-19-related activities are available here**.**

1.9 Strategic Partnerships for SDGs

Today's digital era needs strong collaboration based around cooperation, resource-sharing and win-win-win arrangements that benefit governments, industry and users. A more holistic 'whole-of-

government' approach, in which technology is viewed as a basic enabling service that benefits all, is fundamental. ITU has been putting strong emphasis on forging and reinforcing this type of strategic partnerships that through collaboration ensure better outcomes, more tangible results and stronger impact, with the aim of accelerating the achievement of the SDGs through the use of ICTs.

This section summarizes some of the key partnerships that continued through 2019.

Broadband Commission

ITU and UNESCO set up the *Broadband Commission for Digital Development* in 2010 with the aim of boosting the importance of broadband on the international policy agenda and expanding broadband access in every country as key to accelerating progress towards national and international development targets. Ten years later and re-launched in 2015 as the Broadband Commission for Sustainable Development, the Commission continues to deliver strong high-level advocacy messages to ensure that the benefits of this broadband are realized in all countries.

In 2019 the Broadband Commission continued this work. One of the most impactful outcomes was the work conducted within the Working Group on Broadband for All, which formed the initiative named "A Digital Moonshot Infrastructure for Africa", a multi-stakeholder consultation group to engage key ICT industry partners, estimate the investment needs, and prepare a roadmap to help countries and development actors coordinate, accelerate and prioritize their efforts to improve digital infrastructure in Africa. The outcome of the group, presented in the 2019 Broadband Commission's meeting, proposed a roadmap and action plan for universal, affordable and good quality broadband connectivity in Africa, combining investment needs, sector reforms, and demand stimulation required to advance to a single digital market on the continent. The roadmap included the launch of an action plan for the establishment a global coalition to achieve Africa's digital transformation so that by 2030 every individual, business, and government in Africa is digitally enabled and ready to thrive in the digital economy.

Another relevant activity held in the last year was the organization of a special emergency virtual session of the Commission in April 2020 to coordinate actions to extend Internet access and boost capacity to fight COVID-19. The meeting adopted an Agenda for Action to ensure the networks the whole world is now relying on are robust, resilient and within reach of as many people as possible. The meeting was attended by over 100 representatives from international organizations, the tech sector, civil society and academia, including global CEOs, heads of agency, and leaders of tech and health industry bodies. The UN Under-Secretary-General and Special Advisor, Fabrizio Hochschild, who was invited to participate and made an impassioned plea to Commissioners and their organizations to enhance digital cooperation in response to COVID-19, and to do all in their power to combat misinformation and rising inequality, maximize access to relevant data for public good, and protect the millions of additional children joining the online community for the first time in order to connect to remote learning platforms.

More information about the work of the Broadband Commission can be found here.

EQUALS

EQUALS, the Global Partnership for Gender Equality in the Digital Age, promotes that women and girls are given access, equipped with skills, and develop the leadership potential to work and succeed in the ICT sector. The partnership was founded in 2017 by ITU, UN Women, GSMA, ITC, and UNU and it is governed by a Steering Committee that provides strategic guidance on the development of the partnership.

Today, more than 90 partners from every region of the world have joined EQUALS in a collective call to action that sets out a collaborative and coordinated framework for stakeholders to make specific, measurable pledges across four focus area coalitions (Access, Skills, Leadership and Research) that contribute to address the multiple facets of the gender divide in technology.

During 2019 ITU led in the organization of a large number of activities held within the partnership, such as the coordination of a delegation of EQUALS women-led SMEs in the tech sector that attended ITU Telecom World 2019 or the organization of the sixth annual EQUALS in Tech Awards (formerly GEM-TECH Awards), held in Germany during the Internet Governance Forum with support from the Swiss Federal Office of Communication (OFCOM), the Internet Society, and with support from Inmarsat.

GIGA

Launched in 2019, GIGA is a joint UNICEF and ITU global initiative to connect every school to the Internet and every young person to information, opportunity and choice. Some 3.6 billion people in the world do not have access to the Internet. The lack of access to the Internet means exclusion, marked by the lack of access to the wealth of information available online, fewer resources to learn and to grow, and limited opportunities for the most vulnerable children and youth to fulfil their potential. Closing the digital divide requires global cooperation, leadership, and innovation in finance and technology.

GIGA will bring the power of meaningful connectivity to fast track young people's access to educational resources and opportunities. GIGA will make sure every child is equipped with the digital public goods they need, and empowered to shape the future they want.

The initiative is supported by a broad multi-stakeholder group, consisting of senior industry experts who advise the programme. The initiative has also caught the interest of several large donors who plan to invest in specific GIGA projects and priority regions. Since its launch in September 2019 the initiative has focused on three regions, Central Asia, Eastern Caribbean and Africa, and has:

- mapped more than 800,000 schools in 15 countries, with these maps viewable at www.projectconnect.world. Mapping is currently underway in the Eastern Caribbean region and in Kazakhstan;
- advised participating countries on the best possible technical solutions available to provide schools with required connectivity. In support of this the ITU will be publishing in May a Last Mile Connectivity Toolkit which will be used to provide guidelines and identify solutions to support GIGA countries achieve affordable school connectivity;
- developed specific models for finance and delivery, aimed at subsidizing market creation costs and incentivizing the private sector to invest in school connectivity;
- built on investments by UNICEF's Venture Fund in open source solutions to identify Digital Public Goods that can be delivered and scaled by governments and local industry to make digital content, information and skills available to children, teachers, and administrators;
- on the 31st January 2020 the Vice-Minister of Digital Development of Kazakhstan signed a partnership to support the development of financing models and tools to connect schools and empower young people in the Central Asian region;
- in March 2020 the Organization of Eastern Caribbean States (OECS) agreed to be the regional lead and support the implementation of GIGA in the Eastern Caribbean region.

By the end of 2020 GIGA aims to have launched the first school connectivity bid, as well extend technical assistance and programme support to priority country's school connectivity initiatives.

ITU's participation in the follow up of the High-Level Panel on Digital Cooperation

The High-level Panel on Digital Cooperation was convened in 2019 by the UN Secretary-General to advance global multi-stakeholder dialogue on how the global community can work better together to realize the potential of digital technologies for advancing human well-being while mitigating the risks. In June 2019, the Panel submitted their report, "The Age of Digital Interdependence," which included a set of recommendations to improve digital cooperation.

In support of the follow up to the recommendations of this panel, the office of the UN Secretary-General has convened eight virtual Roundtable groups to discuss if and how each of the recommendations presented in the report can be advanced. "Champions" and "Key Constituents" work to coordinate activities so that duplication of efforts is avoided, and progress can be amplified. ITU was selected as "Champion" for the Recommendation 1A Global Connectivity – together with UNICEF and Uganda - and for Recommendation 2 Digital Help Desks – together with UNDP - based on experience and engagement with the High-level Panel in 2019 and "Key Constituent" for other five Roundtables.

The two roundtables ITU is Championing are in the final stage of providing inputs to the UN Secretary-General's Roadmap on Digital Cooperation. The report will lay out the Secretary-General's vision on how to engage on key issues such as digital connectivity, digital human rights and trust and security. More information on High-Level Panel on Digital Cooperation can be found online.

G20 – ITU as Knowledge Partners

G20 leaders recognize the vast potential of ICTs for advancing the work towards the SDGs through promoting digitalization for all. To move the agenda on the digital economy forward, ITU, along with other international organizations continues to support the G20 as knowledge partner and provide expertise on accelerating ICT growth, development and innovation.

ITU, a trusted partner

In addition to the above-mentioned initiatives, ITU has continued to contribute to a large number of partnerships and to work in close collaboration with relevant organizations as part of the daily work on the Union. This section presents a selection of these partnerships.

- *Radiocommunications.* The ITU's Bureau of Radiocommunication (BR) continues its close cooperation with relevant international and regional organizations dealing with the use of spectrum, including the Regional Telecommunication Organizations (APT, ASMG, ATU, CEPT, CITEL and RCC); broadcasting organizations (ABU, ASBU, EBU and HFCC); and those focused on the use of specific radiocommunication systems and services (*e.g.* ITSO, ESOA, GVF, GSMA). Examples of joint work with these organizations include the organization, promotion and participation in events to build capacity on the use of the Radio Regulations, including World Radiocommunication Seminars and Regional Radiocommunication Seminars. BR has also continued to liaise and cooperate with organizations such as the UN Committee on the Peaceful Uses of Outer Space (UN-COPUOS), the International Maritime Organization (IMO), the International Maritime Satellite Organization (IMSO), the Bureau International des Poids et Mesures (BIPM), the International Telecommunications Satellite Organization (ITSO), COSPAS-SARSAT, the International Committee of the Red Cross (CICR) or the International Civil Aviation Organization (ICAO);
- *Cybersecurity.* ITU is developing relationships and partnerships with various regional/international organizations and initiatives on cybersecurity, including Commonwealth Cybercrime Initiative, ENISA, INTERPOL, ECOWAS, the World Bank, FIRST, and regional CSIRT/CERT associations, such as AP CERT, AFRICA CERT, and OIC CERT;

- *E-waste.* ITU has consolidated the Global E- waste Statistic Partnership founded in 2017 by ITU, United Nations University (UNU) and International Solid Waste Association (ISWA).

1.10 Seminars and workshops

ITU-R

During 2019, five Regional Radiocommunication Seminars were conducted involving experts and participants from around the world; the ITU Regional Radiocommunication Seminar 2019 for Africa (RRS-19-Africa), the ITU Regional Radiocommunication Seminar 2019 for the CIS countries (RRS-19-CIS), the ITU Seminar on Radiocommunication Matters 2019 for Europe (SRME-19), the 3rd ITU Inter-regional Workshop on WRC-19 Preparation and the ITU Satellite Communications Symposium 2019.

As part of the capacity-building partnership between the ITU and ITSO for the delivery of satellite communications related training, five ITU/ITSO Capacity Building Workshops on Satellite Communications were organized in Minsk, Belarus (CIS region, 1-5 April 2019), Asuncion, Paraguay, (Americas region 22-26 April 2019), Maputo, Mozambique, (Africa region in English, 24-28 June 2019), Abidjan, Ivory Coast, (Africa region in French, 8-12 July 2019) and Alger, Algeria, (Arab Countries 13-17 October 2019).

The ITU-R, jointly with ITU-D are participating in the Action from the Policy and Regulatory Initiative for Digital Africa (PRIDA) project "Increasing wireless broadband penetration through improved and harmonized spectrum utilization and regulations".

ITU-R, jointly with the African Telecommunication Union (ATU), launched a process for the optimization of the GE84 Plan for African countries. The main purpose of this optimization is to achieve efficient use of the 87.5-108 MHz (FM) band for analogue sound broadcasting and to allocate new frequencies to FM broadcasting to meet the increasing need for additional frequencies in African countries.

ITU-T

The second ITU-T Study Group Leadership Assembly was held in Budapest, Hungary, 9-10 September 2019, in conjunction with ITU Telecom World. It brought together more than 50 experts holding leadership positions in TSAG, study groups and focus groups to discuss technical matters of growing strategic relevance to ITU standardization and identify associated opportunities for collaboration.

ITU workshops and symposia discuss emerging trends in standardization, increase the visibility of ITU standardization work, enhance ITU-T collaboration with other bodies, attract and recruit new ITU-T members, and encourage peer-learning relevant to international standardization. Over 50 ITU workshops and symposia were organized in the reporting period, addressing topics including security and trust, distributed ledger technologies, data processing and management, digital fiat currency, the future of media and TV, environment, climate change and circular economy, IoT and smart sustainable cities, quality of service and experience (QoS and QoE), innovation towards 5G and beyond, economic and policy issues relevant to international communications, quantum information technologies, intelligent transport systems, autonomous driving and vehicular multimedia, digital financial inclusion, international numbering resources, SMART cable systems for climate monitoring and disaster warning and combatting ICT counterfeiting.

ITU-D

In 2019, over 100 workshops and seminars were conducted on various topics. In capacity development, several regional capacity development workshops were held to assist countries address

the knowledge and skills gaps in the ICT sector with a view to empowering people to acquire the necessary digital skills they need to participate and flourish in the digital economy.

Together with partners, Regional Cyber drills were conducted in 2019 to assist countries increase their cybersecurity capabilities and build trust and confidence in the use of ICTs. See section 1.6.

The role of emerging technologies such as artificial intelligence and the design of innovative digital solutions to improve the quality of life of persons with disabilities, were among the top takeaways from two major ICT accessibility events in the Americas and Europe regions. See section 1.5.

To help countries develop policies and regulatory frameworks to tackle the issue of e-waste, several country and regional-focused training sessions were organized on e-waste data collection.

Four regional training sessions on ICT data collection and measurement were held in 2019 with a view to improve ICT data collection so that policy makers and regulators can make better evidence-based policymaking and to identify gaps in access to ICTs.

Member States and other stakeholders benefited from workshops and trainings on the development and use of ICT applications for smart sustainable cities, satellite technology for digital transformation and broadband mapping.

1.11 Key events

WSIS Forum 2019:

Held from 8-12 April 2019 in Geneva (Switzerland) the World Summit on the Information Society (WSIS) Forum 2019 was co-organized by ITU, UNESCO, UNCTAD and UNDP, in close collaboration with all UN agencies. More than 3,000 individuals representing a large variety of ICT stakeholders participated to foster partnerships, showcase innovation, exchange best practices, and announce new tools and initiatives. It featured over 300 content-rich sessions from over 150 countries and over 500 high-level representatives of the wider WSIS Stakeholder community. This year's programme focused on highlighting the linkages between SDG priority areas such as health, hunger, ICT accessibility, education, youth inclusion, employment, gender empowerment, the environment, infrastructure and innovation and the WSIS Action Lines. The forum also included the announcement of the WSIS Prizes 2019 winners and champions.

The concrete outcomes of WSIS Forum 2019 include the recognition by the Ministerial Round Table participants of the importance of the WSIS Action Lines as a key UN framework for work on the information and knowledge societies, and the UN Group on the Information Society's (UNGIS) Joint Statement at High-Level Political Forum 2019 reiterating the commitment to the WSIS Action Lines implementation and alignment of the WSIS and SDG processes. Highlights and outcomes of the WSIS Forum 2019 are available on the dedicated website.

ITU Kaleidoscope

Host by the Georgia Institute of Technology in Atlanta, Georgia in the United States of America the 2019 edition of Kaleidoscope met under the theme: ICT for Health: Networks, standards and innovation. Nearly 70 delegates from 16 countries participated at the conference and over 30 participants joined remotely such as specialists in the fields of ICT, digital health and socio-economic development, including researchers, academics, students, engineers, computer scientists, policymakers, regulators, innovators, futurists, clinicians and health practitioners.

Selected papers will be submitted to the various ITU Study Groups for consideration in their activities. All papers are available via the dedicated website including the three award-winning papers.

World Telecommunication and Information Society Day (WTISD)

The World Telecommunication and Information Society Day, held annually on 17 May, had its 50th edition in 2019. The theme approved my Member States for 2019 was "Bridging the Standardization Gap", to promote the increased participation of developing countries in ITU's standardization process with a view to bridging the standardization gap. Therefore the focus was on the opportunities for participation of developing countries in ITU's standards-making process, by empowering local experts in the standardization process at the national, regional and international levels as well as promoting the implementation of international standards in developing countries. Six laureates in five categories were awarded for their work to bridge the standardization gap. An archive of the celebrations is available online.

AI for Good

The third AI for Good Global Summit took place from 28-31 May 2019 in partnership with 37 UN sister agencies, XPRIZE and ACM. The goal of the Summit is to connect AI innovators with problem owners to identify practical applications of AI to accelerate progress towards the SDGs. The Summit attracted +2.3K participants, from over 90 countries, of which over 270 delegates were from developing countries and close to 40 per cent women. It also attracted international and multilingual media coverage from outlets such as BBC, CNN and Forbes.

The 2019 Summit was organized into five "Breakthrough Tracks": AI and Health; AI and Education; AI and Human Dignity and Equality; Scaling AI and AI for Space and delivered on its action-oriented promise, generating AI for Good projects in numerous fields. There were also sessions on the future of Smart Mobility, AI and agriculture, AI's role in arts and culture, AI and robotics, and the unintended consequences of AI. In addition, the Summit showcased the latest in AI technologies — from exoskeletons, to autonomous cars, and AI-powered health solutions. The Summit gave rise to 'AI Commons', a framework for collaboration to achieve AI for Good problem solving at scale. This led to the subsequent launch of the Global Initiative on AI and Data Commons in early 2020.

Global Symposium for Regulators (GSR-19)

Regulators from around the world gathered in Port Vila, Vanuatu, from 9 to 12 July for the ITU Global Symposium for Regulators (GSR). They identified and endorsed a set of regulatory Best Practice Guidelines to fast forward digital connectivity and allow people everywhere to benefit from digital transformation and participate in today's digital economy. The Guidelines emphasize the need for a more actionable, collaborative, and innovative outcome-based approach to regulation and urge regulators and all stakeholders to be open to new regulatory tools and solutions and act.

They call for the adoption of three new and innovative approaches for achieving inclusive digital infrastructure and services, based on: 1) Core design principles for collaborative regulation − to help respond to new technology paradigms and business models 2) Benchmarks for regulatory excellence and market performance − grounding regulatory decisions in robust, multifaceted and thoughtfully interpreted evidence can prove instrumental in generating positive market dynamics in the short and long term, and 3) Regulatory tools and approaches at hand for enabling digital experimentation − to contribute towards improving digital market outcomes, countries need to leap forward to the next level of collaborative regulation with a new attitude and a new toolbox.

ITU Telecom World 2019

ITU Telecom World 2019 took place from 9 to 12 September in Budapest, Hungary, bringing together governments, corporates and tech SMEs to exhibit innovative solutions, network, share knowledge and debate with experts under the theme "Innovating together; connectivity that matters". Over 4'000 participants from 135 countries attended the event including Heads of State, Ministers, key industry players from major corporates and tech small- and medium-sized enterprises (SMEs) met to accelerate ICT innovation to improve lives faster.

The event included high-level debate, dialogue between business, a raft of innovative SMEs in technology and governments, showcasing, networking and a high-profile Awards Programme and ceremony. The event closed with the ITU Telecom World Awards where a host of life-changing innovations were highlighted. Winning innovations from SMEs and major corporates showcased areas as diverse as online education, 5G airships and drones, green 5G, digital addressing, transforming digital heat from data-centres, nanosatellites and enabling barrier free emergency calls. Event highlights can be found in the post-event report as well as online.

2. Other key activities by the Secretariat to support ITU Membership

The ITU Secretariat (through its three Bureaus and the General Secretariat) continues to refine and improve the services that it provides to ITU Membership as a whole. This section summarizes some of the new initiatives undertaken in the period covered by this report on four key aspects of ITU's services to its members: ensuring the operation of its governing bodies, introducing state of the art collaborative tools, refining the structure of functional units to adjust better to the challenges and opportunities that arise from an increasingly digital society and strengthening the overall support services to ITU Membership.

2.1 ITU-R

Radio Regulations Board (RRB)

The RRB continued to conduct its work throughout the year, achieving the following results:

- *Update of the revised Rules of Procedure. T*he RRB implemented the decisions made by WRC-15 and approved a revision of the 2017 Rules of Procedure. The updated rules are based on common practices of the Bureau in the application of the Radio Regulations and Regional Agreements;
- *Extension of the regulatory deadline of satellite networks*. The Board acceded to four cases requesting an extension of the regulatory deadlines to bring into use frequency assignments to satellite networks (one case of *force majeure*, three cases of co-passenger delay). The Board rejected two cases of co-passenger delay and rejected one case of *force majeure,* instructing the Bureau to continue monitoring these satellite networks until WRC-19. The Board rejected one case that was considered neither a case of *force majeure* nor co-passenger delay;
- *Maintain satellite networks in or suppress them from the MIFR*. The Board decided to suppress one case resulting from an examination under RR No. **13.6**, instructing the Bureau to continue to take into account the frequency assignments to the satellite network until WRC-19;
- *Requests for the suppression of frequency assignments to satellite networks.* The Board

- received requests from two administration for the suppression of the frequency assignments to satellite networks of two other administrations. In both cases, the latter two administrations invoked CS Article 48. However, the administrations were invited to address these matters by coordination and subsequently successfully resolved these two cases. The Board also received an appeal to a prior decision relating to the suppression of frequency assignments to a satellite network. Since decisions of the Board are final and appeals to decisions of the Board can only be considered by a WRC, the Board was unable to accede to this appeal;
- *Other cases.* The Board regularly reviewed the longstanding situation of harmful interference caused by television and sound broadcasting stations in the VHF and UHF bands to its neighbouring countries. Concerning television, a few cases of harmful interference remain to be resolved. Furthermore, the respective national administration provided and is regularly updating a road map for resolving cases of harmful interference to a list of priority sound broadcasting stations. The RRB also continued to review a case of reported harmful interference to coordinated emissions from HF broadcasting stations of one administration. The administrations involved successfully resolved the harmful interference by coordination.

2.2 ITU-T

TSB has developed modern tools and introduced significant improvements to the working methods of the Bureau, contributing to enhancing the services provided to its membership. Indeed, 2020 has highlighted the value of ITU-T's electronic working environment, which had received an important upgrade during the year. Virtual meetings and electronic working methods have come to form the principal platform for ITU standardization work as part of the global response to COVID-19 (see Section 1.8).

ITU members engaged in standards development and preparations for the ITU World Telecommunication Standardization Assembly (WTSA-20) are making optimal use of the personalized MyWorkspace platform and its associated services and tools developed by TSB. ITU members and TSB staff are working in close collaboration to facilitate the behavioural change necessary to achieve ITU-T's targets for 2020. In addition, a service announcements platform, http://tsbtech.itu.int/, keeps the ITU-T community up to date with the latest enhancements to TSB services and tools.

Highlights of the main improvements introduced in 2019-2020:

- **MyWorkspace**. MyWorkspace is a set of mobile-friendly tools and services introduced in 2017 in response to WTSA Resolution 32 to facilitate the work of ITU-T experts. Version 3.0 of the platform, released in 2019, enhances the user interface and includes a new section for ITU-T events. MyWorkspace is accessible through a responsive website and new mobile application. Secure access to MyWorkspace is enabled through ITU User Account (TIES) credentials. The following services are available from the platform:
    - ITU-T experts directory;
    - Chat service for real-time communication;
    - Meeting documents with the option to bookmark favourites;
    - Mailing list subscriptions;
    - Calendar of ITU-T events with filters by working group;
    - User profile management (CRM profiles) and additional preferences;

  - New applications included in 2019: (a) Neural-net based machine translation prototype for documents in the six official languages (including formatting); (b) Remote participation service frequently used by SGs, based on an open-source tool; and (c) New ITU-T events service, fully integrated with CRM events and registered participants, including a 'matchmaking' feature to enhance delegate networking.

- **ITU-T SharePoint collaboration sites.** The ITU-T SharePoint collaboration sites enable participants in ITU-T working groups to conduct online discussions, work on projects, schedule meetings and manage and store documents in a secure shared environment, restricted to users with a TIES account and in some cases to non-member ITU User Accounts. The home of ITU-T SharePoint collaboration sites can be accessed online. A support site containing a knowledge base of FAQs and user guides on the various SharePoint services is available online.

- **Document Management System for Rapporteur Groups.** The Microsoft SharePoint-based Document Management System for ITU-T Rapporteur Group Meetings (RGMs) is one of several services available in the ITU-T SharePoint collaboration sites that has been used extensively by the majority of ITU-T SGs, a well as TSAG. The platform can only be accessed with a TIES account. Feedback from Rapporteurs drives the continuous improvement of the RGM system. Current and past RGM meetings can be accessed online. A comprehensive support and FAQs page offering RGM tips and best practices is available online, and a detailed online user guide is also online.

- **Meeting Documents Sync Application.** This application enables meeting participants to synchronize documents of ongoing ITU-T SG meetings from the ITU server to their local drive. The application is constantly enhanced and updated following feedback and suggestions from users.

2.3 ITU-D

A journey of change towards impact and results: a BDT Fit4Purpose

In 2019, BDT began a journey of change to create a Bureau that is able to keep pace with the fast-changing environment in which it serves, that responds effectively to the needs of Member States and Sector Members, and that is more relevant and demonstrates impact and results: a Fit4Purpose BDT. Following extensive internal consultations, BDT has adopted new innovative ways of working, laying foundations that will ensure timely and efficient implementation of the Buenos Aires Action Plan.

The BDT journey for change is a participatory and open consultative process, which relies heavily on feedback and discussion with Member States and Sector Members. This consultative process has helped to streamline priorities and goals, accelerating BDT responsiveness while strengthening its impact. BDT efforts towards digital transformation through meaningful connectivity are people centric, where the focus is on listening to the people who BDT is trying to reach, allowing for a better assessment of their needs to improve their lives.

For this purpose, BDT has adopted a cluster-based approach. The clusters, defined by the programmes of the Buenos Aires Action Plan, will sharpen BDT focus on thematic priorities, and thus strengthen the impact for ICT development, while also facilitating coordination and synergy across key programmes, projects, and initiatives.

To ensure an efficient and effective implementation of the BDT work programme, the Bureau has expanded its results-based management (RBM) approach. The RBM approach also re-emphasizes BDT

focus on partnering with a wide range of stakeholders, including other United Nations agencies, other funding agencies, Member States and Sector Members, both to reduce the risks as well as increase scope and impact as outlined in the impact pathways.

2.4 General Secretariat

ITU Sector Members, Associates and Academia: key stakeholder groups in ITU´s activities

ITU Sector Members, Associates, and Academia play a fundamental role in the activities on the Union. ITU's global membership includes companies, universities, research institutes, and international and regional organizations that represent a cross-section of the global ICT sector, from the world's largest manufacturers and carriers to small, innovative players working with new and emerging technologies.

During the last year, the ITU Secretariat (through the GS, the three bureaux, and regional offices) continued implementation of a coordinated strategy launched several years ago to reach out to new audiences to widen and diversify ITU's membership, while applying a customer-centred approach to improve the services provided to its members, so that they are engaged, involved and empowered by ITU activities.

An important element of this coordinated outreach and customer-centric focus has been the implementation of initiatives such as the annual survey to ITU industry and academia members to gather feedback, ITU News articles highlighting member activities, and the soon-to-be launched "My ITU" platform, which will provide thematic content tailored to the interests of members as well as new audiences who are less familiar with ITU, including SMEs, Academia and players from other industries. Building on initiatives led by the three Bureaux to meet the specific expectations of their Sector audiences, these ITU-wide initiatives are helping the Secretariat better understand and adjust to the needs and areas of interest of its Membership as well as prospective new members and the broader ICT community (see Box below for further details).

Box 1. ITU Membership Survey 2019

- High response rate: 24% of ITU Member entities from 62 countries. Good representation between Sectors, Categories and Regions.
- Very high level of satisfaction:
  - **96% of respondents are satisfied/very satisfied with the ITU**
  - **94% are satisfied/very satisfied with the value they get from their membership**.
- Main areas of interest:
  - **5G** (74%), **Internet of Things** (61%), **Standards** (58%), **Artificial Intelligence** (45%), **Smart Cities** (37%), **Infrastructure** (36%), **Cybersecurity** (35%), **Digital Transformation** (33%) **and Policy and Regulation** (31%).
- 85% of respondents would be interested to receive ITU content on the areas they selected.
- Members plan greater participation, especially in study groups, and plan to use more remote participation

ITU's membership evolving to better reflect the changing ICT ecosystem

In addition, ITU has adopted a proactive approach to attract new members from across a wide range of new industries and sectors such as digital finance, energy, cloud computing, IoT, quantum information technology, or automotive industries, which are increasingly becoming part of the expanded digital ecosystem. At the end of the year ITU membership had reached over 900 members, the highest number ever reached by ITU, with 112 new memberships (see figure below). This positive trend was observed across all sectors, with the strongest growth in industry membership coming

through ITU-T). Leading academia specializing in emerging topics also joined ITU attracted by new activities. In short, new areas of work at ITU are attracting new players to join ITU, thus helping ITU membership evolve to be more inclusive and reflect the changing ICT ecosystem.

Net Membership by Sector/type (2009-2019)

Net Membership by Sector/Type

Sector	Membership type	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ITU-R	Sector member	264	248	255	255	258	259	270	267	265	263	272
	Associate	13	17	18	16	16	15	18	19	21	21	22
ITU-T	Sector member	290	261	263	267	274	272	266	253	257	257	268
	Associate	101	111	119	128	130	132	132	128	137	157	184
ITU-D	Sector member	314	309	320	329	344	336	337	323	314	306	307
	Associate		5	6	7	9	10	11	11	12	14	17
Academia*	Academia*			23	40	58	73	95	107	124	153	163

Explanation
- Blank cells represent a year with no movement at all
- Beige cells represent a net movement of zero (ie. New = (Denounced + Excluded)
- Green cells represent positive net movement within the year (ie. New Members > Denounced + Excluded)
- Red cells represent negative net movement within the year (ie. New Members < Denounced + Excluded)
- Darker colours represent greater numbers

Facilitating the participation of SMEs in ITUs work

An estimated 10% of ITU's current membership, mainly Associates, could be considered as SMEs, depending on the definition. Building on this foundation, ITU welcomed more than 25 SMEs in interested study groups in ITU-T and ITU-D over the course of 2018-2019 as part of pilot project established by Council 17. This pilot project was aimed at strengthening participation of SMEs in the work of ITU.

Recognizing the success of this pilot project, PP-18 Res. 209 (Dubai, 2018) established a new reduced fee for small and medium enterprises (SMEs) that join as Associates of a given Study Group across all three sectors. Council 19 finalized the criteria and decided to wind down the pilot project, and launch the new reduced fee effective January 2020.

ITU also has a number of specific activities and platforms tailored to the needs of SMEs, including the ITU Telecom World programme for SMEs and its ITU SME Awards, ITU Smart Incubator programme, ITU Innovation challenges, AI for Good Innovation Factory and ITU training among others. During Telecom World 2019, the ITU Secretary-General organized a consultation session for Member States: Promoting Tech SMEs and Innovation. The objective of this consultation was to share existing policies and initiatives to promote tech SMEs and to discuss specific efforts that could be made to bring more SMEs to ITU.

More information about ITU´s services in support of its members is available online

3. ITU Strategic Plan Implementation: Progress towards Strategic Goals and Objectives

The Connect 2030 Agenda was adopted by the 2018 Plenipotentiary Conference as part of ITU's Strategic Plan for the 2020-2023 quadrennium. At the heart of the Agenda and the ITU strategic plan are five goals which include 24 strategic targets designed to track the progress towards each goal up to 2023 and to help ITU and other stakeholders focus their priorities during that period. These goals/targets aim to demonstrate ITU's impact on people's lives. ITU's contribution to the achievement of the goals/targets is materialized by means of the sector and inter-sectoral objectives, which mainly represent the outcomes of ITU's work. ITU's activities result on the outputs (products and services) which support the achievement of these outcomes.

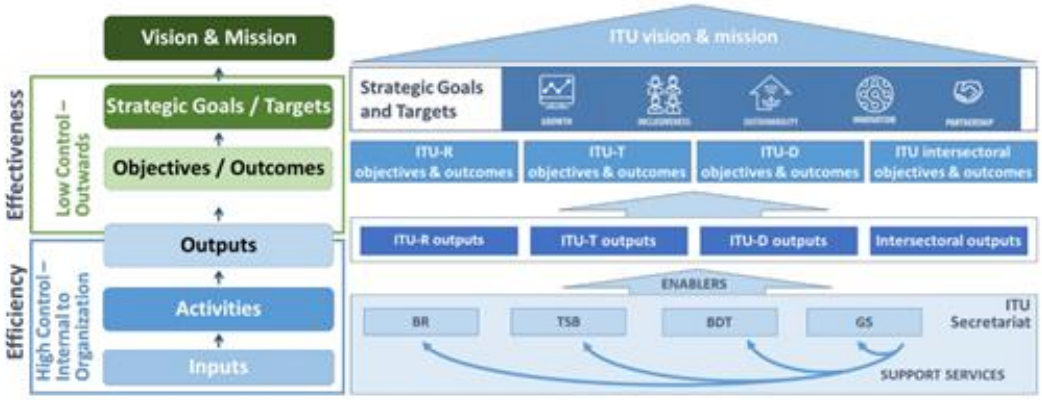
The essential contribution made by the ITU Secretariat (GS and Bureaux) is assessed by the Enabler indicators showing the efficiency of the support services and its contribution to the achievement of the overall outputs. This layer of the results framework is fully under control of the ITU.

Progress Towards the Strategic Goals and Objectives

The progress in the implementation of the Strategic Plan for the Union is assessed through a set of indicators at different levels in the ITU results framework (see figure below). The assessment of progress towards Goals and Objectives is done by measuring:

- **24 targets** at the impact level;
- **64 outcome indicators**. This layer of the results framework is composed by: ITU-R: 3 objectives and 15 outcomes; ITU-T: 5 objectives and 14 outcomes; ITU-D: 4 objectives and 16 outcomes; inter-sectoral: 6 objectives and 19 outcomes;
- **40 enabler indicators.**

Sections below present a summary of the dashboards showing the assessment of ITU performance.



The analysis of the results in the charts below, showing progress towards the Strategic Targets, allows to draw the following conclusions:

- **Internet usage keeps growing, but barriers lie ahead:** An estimated 4.1 billion people were using the Internet in 2019, reflecting a 5.3 per cent increase compared with 2018. The global penetration rate increased from nearly 17 per cent in 2005 to over 53 per cent in 2019. Between 2005 and 2019, the number of Internet users grew on average by 10 per cent every year. In recent years though, global growth rates are not as a high as a decade ago because some parts of the world are reaching saturation levels.
- **Most of the offline population lives in least developed countries (LDCs):** In developed countries, most people are online, with close to 87 per cent of individuals using the Internet. In LDCs, on the other hand, only 19 per cent of individuals were online in 2019. In terms of users per 100 inhabitants, Europe is the region with the highest Internet usage rates while Africa is the region with the lowest usage rates;
- **The digital gender gap is growing fast in developing countries:** In all regions of the world, more men than women are using the Internet. The gap is small in developed countries and large in developing countries, especially LDCs. Between 2013 and 2019, the gender gap hovered around zero in the Americas and has been shrinking in the CIS countries and Europe. However, in the Arab States, Asia and the Pacific, and Africa, the gender gap has been growing.

The global gender gap has increased owing to the rapid growth in the number of male Internet users in developing countries;

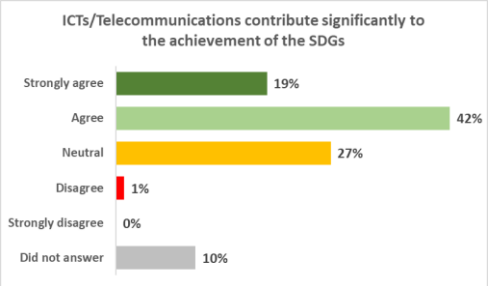
- **Mobile-broadband subscriptions continue to grow strongly:** The number of active mobile broadband subscriptions per 100 inhabitants continues to grow strongly, with an 18.4 per cent year-on-year growth. The correlation between level of development and uptake of mobile subscriptions is much weaker, reflecting the better affordability and availability of mobile compared with fixed network connections. The relatively small difference between developed and developing countries also shows that connectivity is a priority among people in countries at all levels of development;
- **Bandwidth growing fast but with regional differences:** International bandwidth usage grew by 33.4 per cent on average annually between 2015 and 2019. In terms of kbit/s per Internet user, Europe has by far the highest bandwidth usage (211 kbit/s), followed by four regions with similar bandwidth usage (between 100 and 130 kbit/s). Africa is lagging behind, with 31 kbit/s per Internet user;
- **Broadband still expensive in LDCs:** In 2019, in 61 countries, a fixed-broadband subscription including 5 GB of data costs less than 2 per cent of GNI per capita. A mobile-broadband subscription with a 1.5 GB data package costs less than 2 per cent of GNI per capita in 89 countries, including four LDCs. Although considerable progress has been made in recent years, affordability remains a challenge in many countries, especially LDCs;
- **Challenges from the ICT sector are increasing**: the level of energy consumption and the emission of greenhouse gases (GHGs) are increasing for the growing spread and use of ICT services, networks and devices. The volume of e-waste is on the rise, from 44.7 Megatons generated in 2016 to 53.6 Megatons in 2019, while the percentage of this e-waste which is documented to be collected and properly re-cycled decreased from 20% to 17.4% in the same period. The cyberthreats are also on the rise. However, the percentage of countries having established a CIRT, CERT or CSIRT did not increase from 2018 to 2019, staying at 56%;
- **More countries are starting to set up policies/strategies fostering telecommunication/ICT-centric innovation**: in 2019 66 countries are documented to have policies/strategies fostering telecommunication/ICT-centric innovation. As this is a new indicator, more data should be gathered next year to confirm progress or not towards the 100 countries target by 2023;
- **Partnerships in the telecommunication/ICT sector are perceived as showing a positive trend:** Only 4% of ITU members surveyed in 2020 disagree or strongly disagree with the sentence “Your organization is collaborating with other stakeholders more than in previous years”; and only 2% disagree with the sentence “Your organisation is benefiting with increased synergies by working with others”, in the same ITU membership survey 2020.

How many indicators towards the strategic targets are showing positive progress?

As detailed in section 3.1 below, 62.5% of the 24 ITU strategic targets are either already achieved (12.5%) or well on track for achievement by 2023 (50%). On the other hand, attention should be drawn to the fact that 4 targets (16.7%) are off track for achievement by 2023, the targets related to Internet penetration in LDCs, as well as the target related to Gender equality online and the target related to the volume of re-cycled e-Waste. A number of targets (20.9%) have just been benchmarked (i.e. a baseline has been set up or a measurement agreed on) or have not yet been measured. For the targets already achieved in 2019, proposals could be introduced to update them with more ambitious values.

How much ICTs/Telecommunications contribute to the SDGs?

To assess the perception ITU members have about ICTs/Telecommunications contributing to the SDGs, a new question has been added to the ITU Membership survey 2020. The results are encouraging: only 1% disagree and more than 60% agree or strongly agree with the sentence "ICTs/Telecommunications contribute **significantly** to the achievement of the SDGs", see chart below.



Source: ITU

3.1 Results per Strategic Goal

3.1.1 Goal 1 - Growth

Enable and foster access to and increased use of telecommunications/ICT in support of the digital economy and society.

Strategic targets:

By 2023:

Target 1.1: 65% of households worldwide with access to the Internet

Target 1.2: 70% of individuals worldwide will be using the Internet

Target 1.3: Internet access should be 25% more affordable (baseline year 2017)

Target 1.4: all countries adopt a digital agenda/strategy

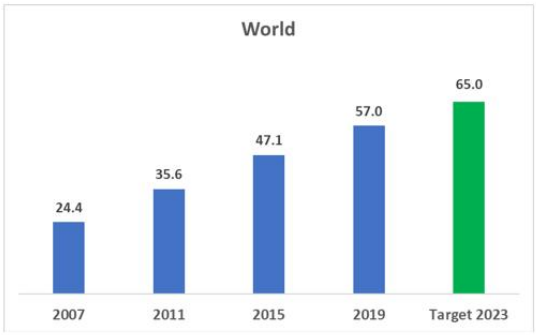
Target 1.5: increase the number of broadband subscriptions by 50%

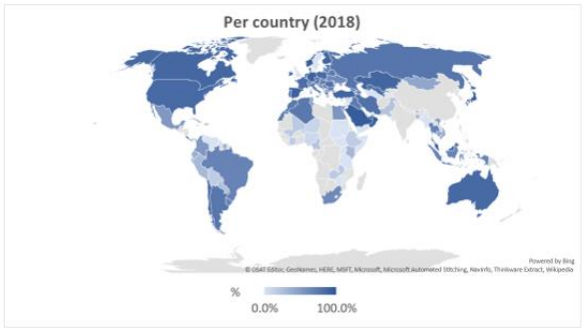
Target 1.6: 40% of countries to have more than half of broadband subscriptions more than 10 Mbit/s

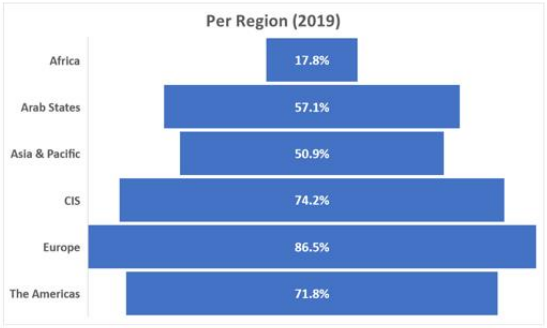
Target 1.7: 40% of the population should be interacting with government services online

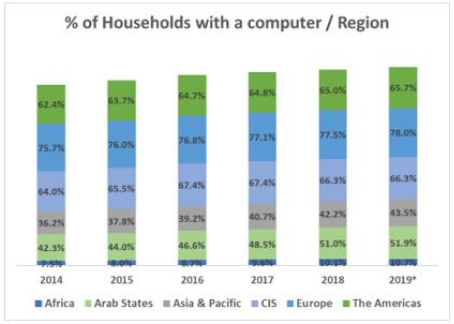
Progress achieved

Target 1.1: Households with Internet access — ***Target on track for achievement by 2023***



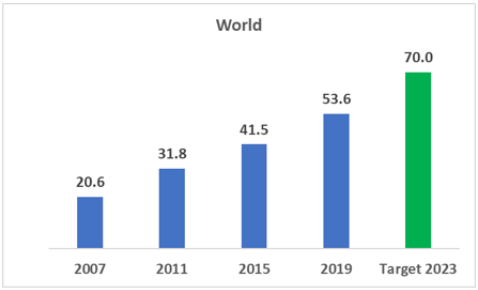


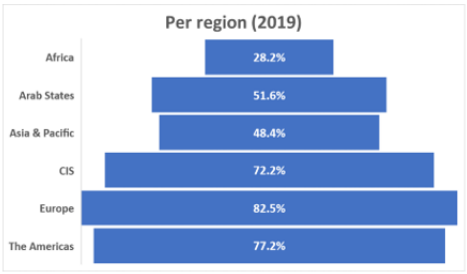


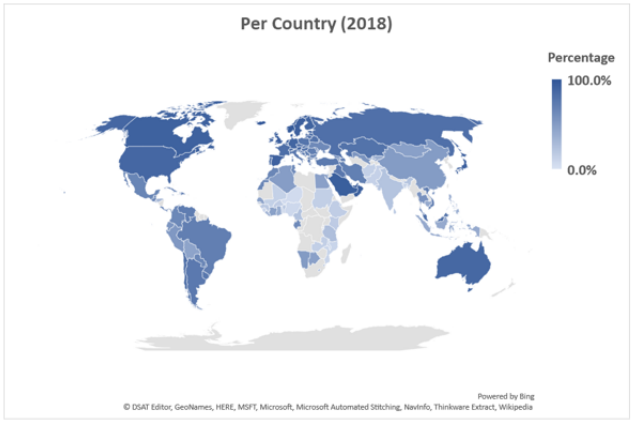


Source ITU

Target 1.2: % of Individuals using the Internet — ***Target on track for achievement by 2023***

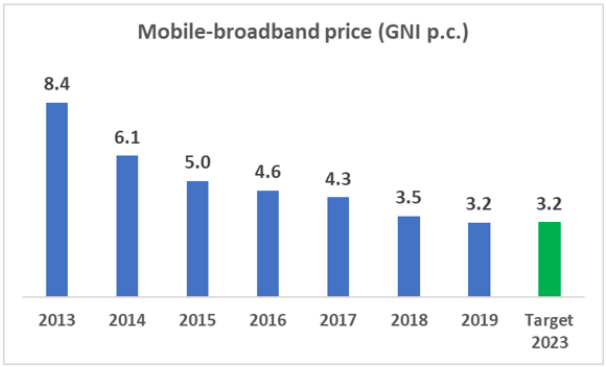






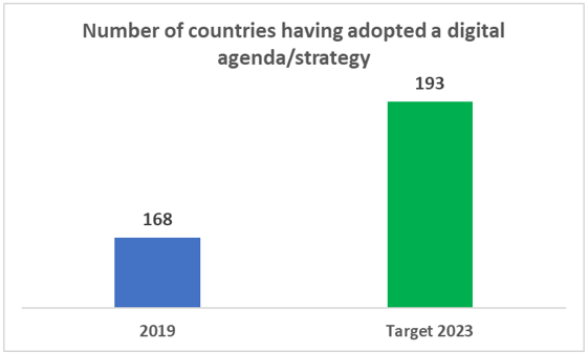
Source ITU

Target 1.3: Affordability of Internet access *Target achieved*



Source ITU

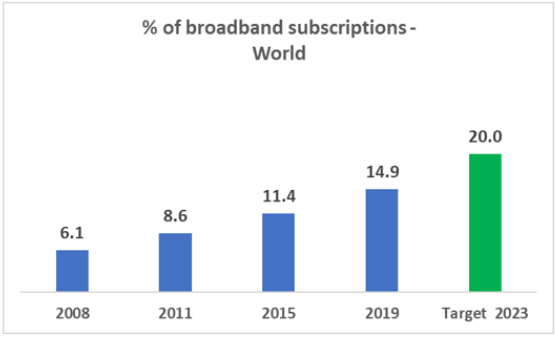
Target 1.4: Countries with a digital agenda/strategy *New Target, benchmarked, good starting value*

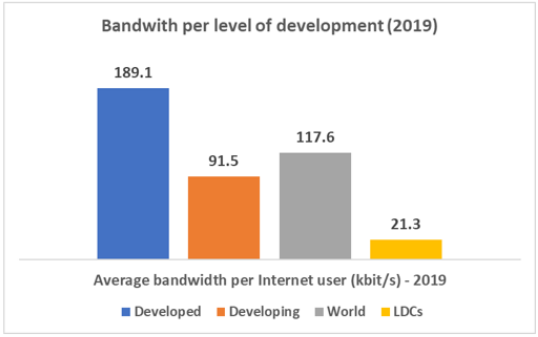


Broadband plans, ICT strategies including broadband and digital agendas are counted here

Source ITU

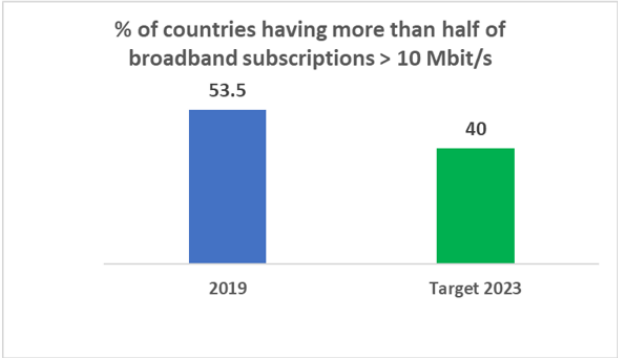
Target 1.5: Broadband subscriptions *Target on track for achievement by 2023*





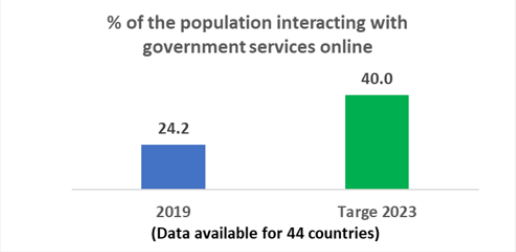
Source ITU

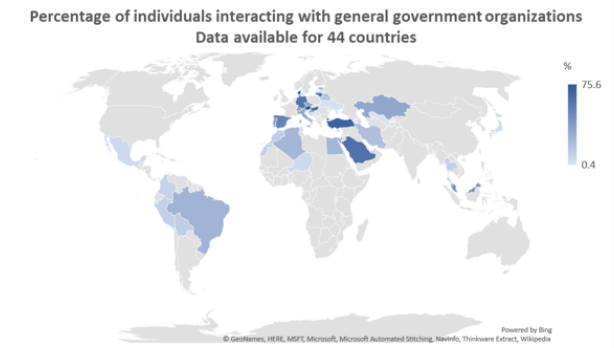
Target 1.6: Broadband subscriptions with more than 10 Mbit/s ***Target achieved***



Source ITU

Target 1.7: % of the population interacting with gov. services online ***New target, benchmarked***





Source ITU

3.1.2 Goal 2 - Inclusiveness

Bridge the digital divide and provide broadband access for all

Strategic targets:

By 2023:

Target 2.1: in the developing world, 60% of households should have access to the Internet

Target 2.2: in the least developed countries, 30% of households should have access to the Internet

Target 2.3: in the developing world, 60% of individuals will be using the Internet

Target 2.4: in the least developed countries, 30% of individuals will be using the Internet

Target 2.5: the affordability gap between developed and developing countries should be reduced by 25% (baseline year 2017)

Target 2.6: broadband services should cost no more than 3% of average monthly income in developing countries

Target 2.7: 96% of the world population covered by broadband services

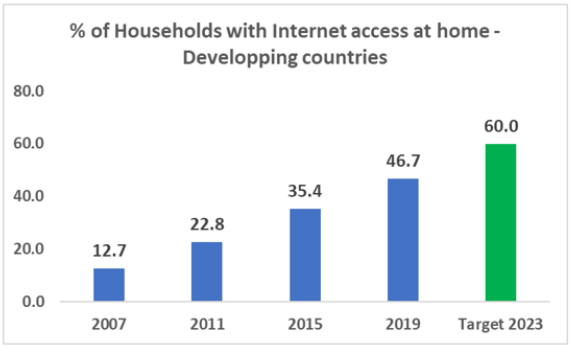
Target 2.8: gender equality in Internet usage and mobile phone ownership should be achieved

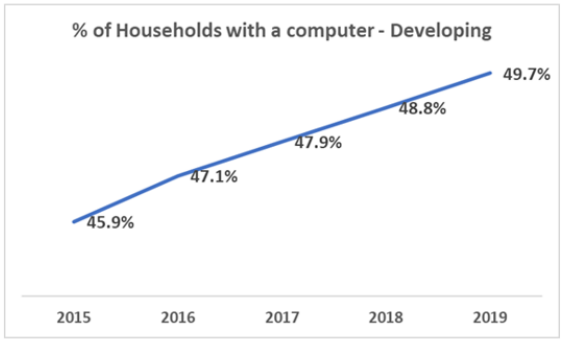
Target 2.9: enabling environments ensuring accessible telecommunications/ICTs for persons with disabilities should be established in all countries

Target 2.10: improve by 40% the proportion of youth/adults with telecommunication/ICT skills

Progress achieved

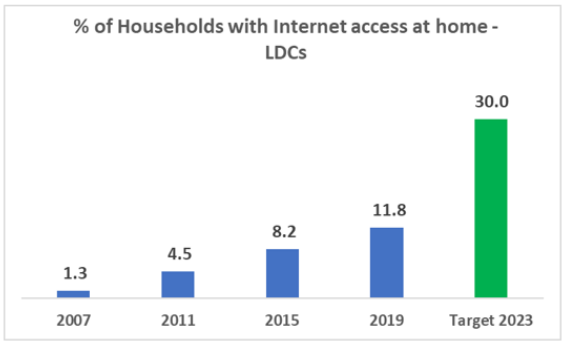
Target 2.1: % of Households with internet access – Developing *Target on track for achievement by 2023*

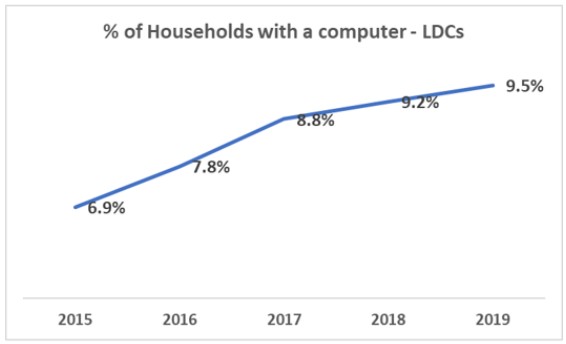




Source ITU

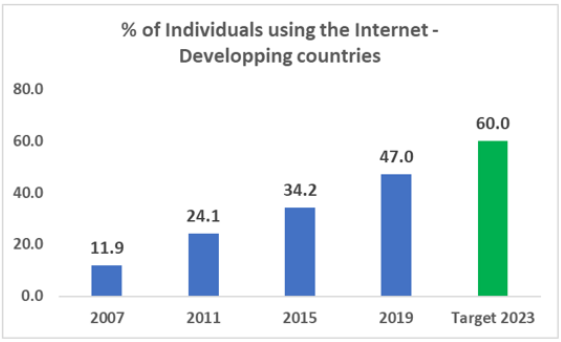
Target 2.2: % of Households with internet access – LDCs *Target off track*





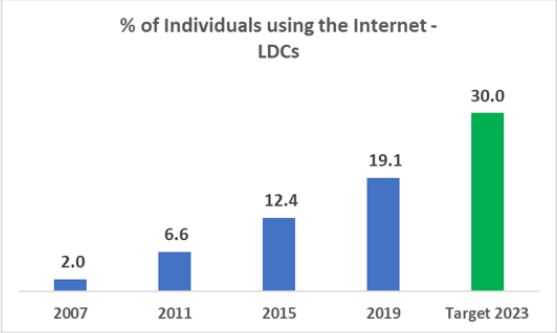
Source ITU

Target 2.3: % of Individuals using the internet – Developing *Target on track for achievement by 2023*



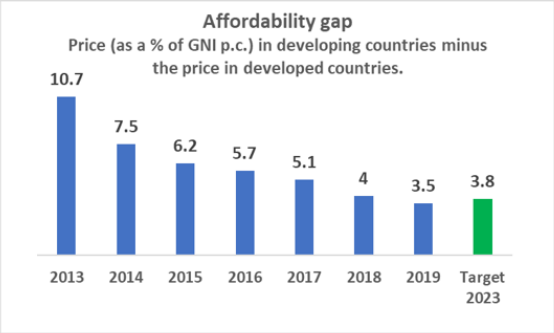
Source ITU

Target 2.4: % of Individuals using the internet – LDCs *Target off track*



Source ITU

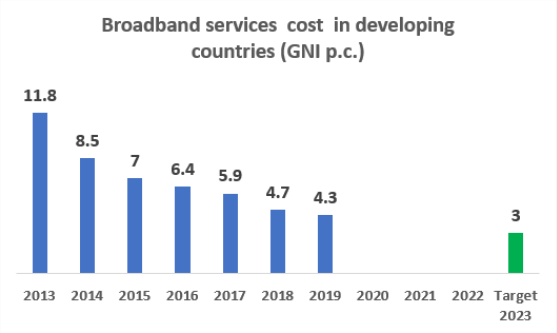
Target 2.5: Affordability gap *Target achieved*



2013: MBB data-only; as from 2014: GNI pc

Source ITU

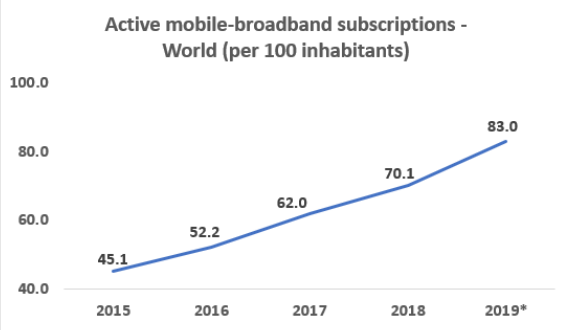
Target 2.6: Broadband cost in developing countries *Target on track for achievement by 2023*

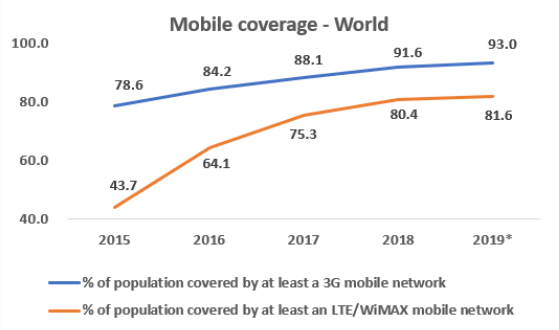


Source ITU

Target 2.7: World population covered by broadband services

Target on track for achievement by 2023

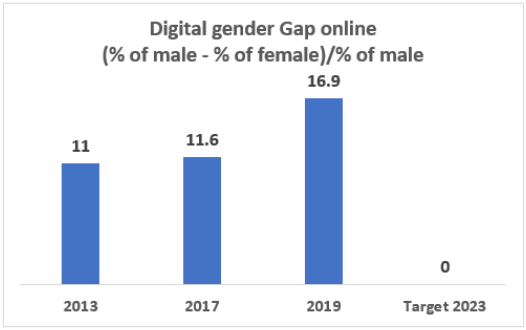


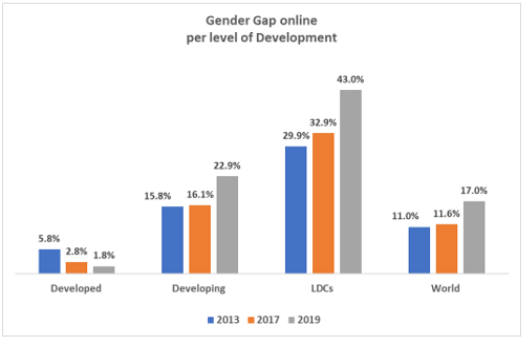


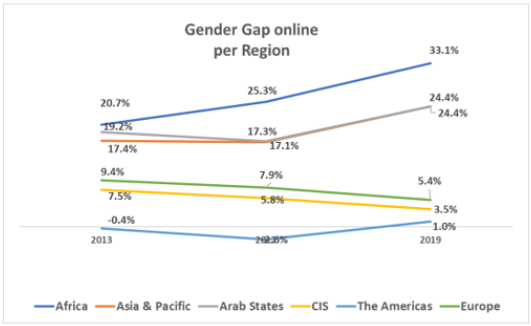
Source ITU

Target 2.8: Gender equality online

Target off track







New! - Mobile ownership per gender

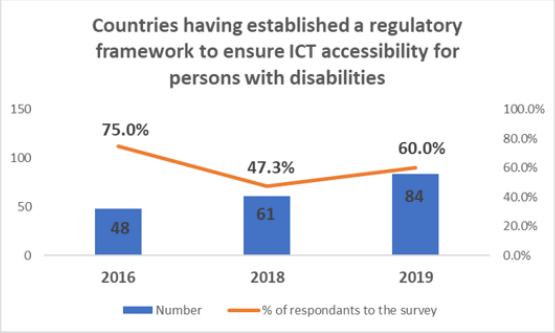
World – 2019

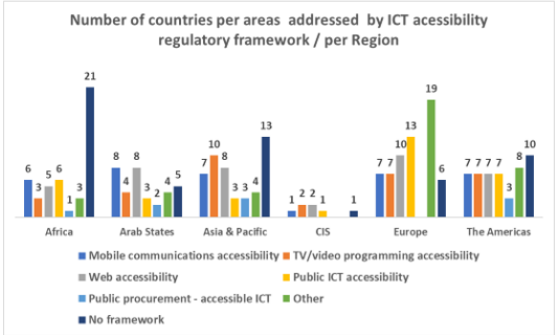
For the 59 countries for which data are available, there is a **6.6 percentage** point difference between man and women owning a mobile phone.

Source ITU

Target 2.9: Accessibility frameworks

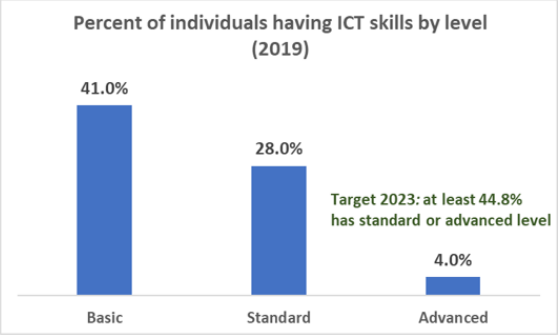
Target on track for achievement by 2023





Source ITU

Target 2.10: ICT skills ***New Target, benchmarked***



Source ITU

3.1.3 Goal 3 – Sustainability

Manage emerging risks, challenges and opportunities resulting from the rapid growth of telecommunications/ICT

Strategic targets:

By 2023:

Target 3.1: improve cybersecurity preparedness of countries, with key capabilities: presence of strategy, national computer incident/emergency response teams and legislation

Target 3.2: increase the global e-waste recycling rate to 30%

Target 3.3: raise the percentage of countries with an e-waste legislation to 50% [Note: should read "policy, legislation or regulation"]

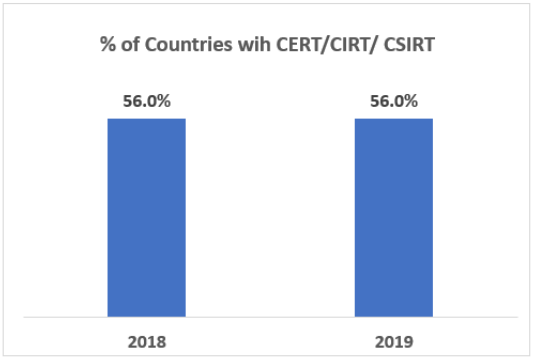
Target 3.4: net telecommunication/ICT-enabled Greenhouse Gas abatement should have increased by 30% compared to the 2015 baseline

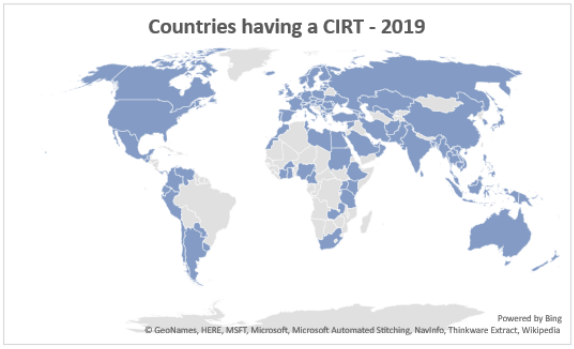
Target 3.5: all countries should have a National Emergency Telecommunication Plan as part of their national and local disaster risk reduction strategies

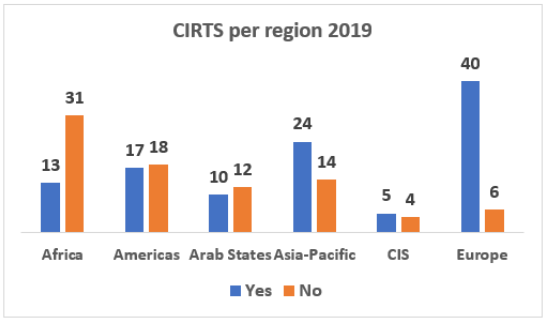
Progress achieved

Target 3.1: Cybersecurity

Target on track for achievement by 2023



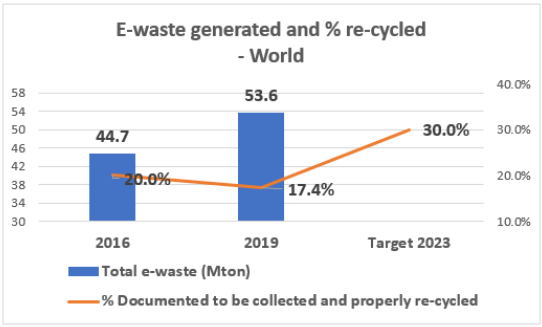


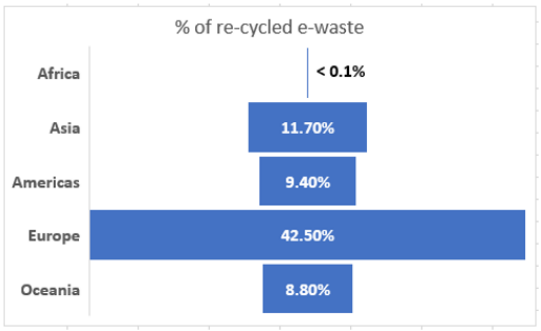


Source ITU

Target 3.2: e-Waste

Target off track





Source Global E-waste Monitor 2020

Target 3.3: Countries with an e-waste legislation

New target, benchmarked

New Target! Included in the BDT regulatory survey 2020.
Initial data should be available by October 2020

Source ITU

Target 3.4: Net telecommunication/ICT-enabled Greenhouse Gas abatement

New target, not measured yet

Not yet measured. Looking for data or for a good proxy. We may not be able to find a 2015 baseline, so target needs to be redefined.

Target 3.5: Countries with a National Emergency Telecommunication Plan *New target, benchmarked*

New Target! Included in the BDT regulatory survey 2020.
Initial data should be available by October 2020

Source ITU

3.1.4 Goal 4 – Innovation

Enable innovation in telecommunications/ICT in support of the digital transformation of society

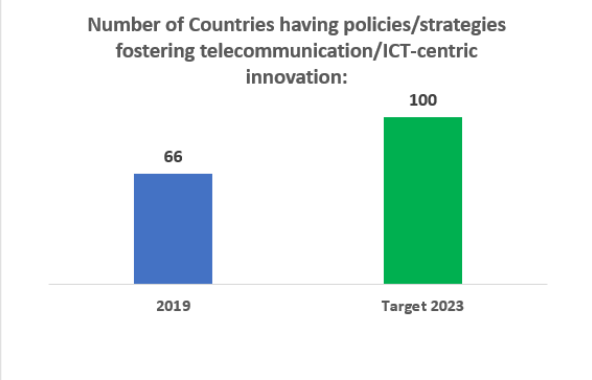
Strategic target

By 2023:

Target 4.1: all countries should have policies/strategies fostering telecommunication/ICT-centric innovation

Progress achieved

Target 4.1: Countries having policies/strategies fostering telec. /ICT-centric innovation *New Target, benchmarked*



Source ITU

3.1.5 Goal 5 – Partnerships

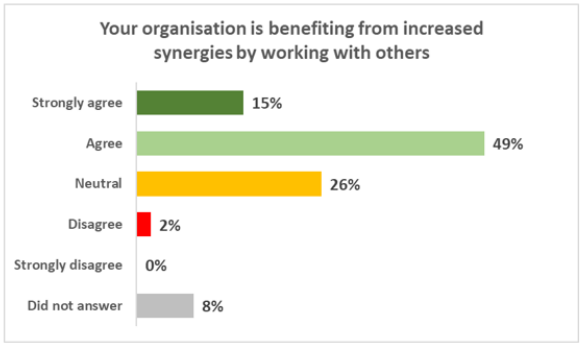
Strategic target

By 2023:

Target 5.1: increased effective partnerships with stakeholders and cooperation with other organization and entities in the telecommunication/ICT environment

Progress achieved

Target 5.1: Partnerships ***New Target, benchmarked, good starting point***



Source ITU

3.2 Outcomes of the work of the Union – ITU sector and inter-sectoral objectives

See Annex 2.

3.3 Results of the Enablers

See Annex 2.

3.4 Priorities for 2020-2021

- Organization of the World Telecommunication Standardization Assembly (WTSA-20);
- Preparatory processes for the World Telecommunication Development Conference (WTDC-21) and the World Telecommunication/ICT Policy Forum (WTPF);
- Implementing the Connect 2030 agenda, ensuring alignment with the SDGs (as per the theme of the 2020 World Telecommunication & Information Society Day – WTISD);
- Working as One ITU, being an agile, responsive and innovative organization;
- Enhancing efficiency and effectiveness of the organization, by developing long-term managerial strategy for the organization to sustain performance and relevance of expertise, by strengthening the risk management and accountability frameworks, in order to enable informed decision-making and demonstrate the impact of ITU's work.

Annex 1 Implementation of PP Resolutions

Status of Implementation
21 (Rev. Dubai, 2018) Measures concerning alternative calling procedures on international telecommunication networks ITU-T SG2 continued work on draft new Recommendation ITU-T E.ACP on Alternative Calling Procedures. Completion of this work is expected during 2020. ITU-T SG3 continues to receive contributions on this topic in work item STUDY_ACPMIS on Alternative Calling Procedures, and misappropriation and misuse of facilities and services, and work is ongoing in the Rapporteur Group Q8/3 and studying work item D.SIMBOX on simboxing. SGs 2 and 3 are liaising on alternative calling procedures.
30 (Rev. Dubai, 2018) Special measures for the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition Assistance to the least developed countries, small island developing states, landlocked developing countries, and countries with economies in transition is ongoing through operational plan activities, projects, and ad hoc assistance. The work is guided by the ITU Strategic Plan and ITU-D Action Plan adopted at WTDC-17.
34 (Rev. Dubai, 2018) Assistance and support to countries in special need for rebuilding their telecommunication sector Support to countries during natural disasters and emerging out of major disasters is ongoing and has been under implementation in support of affected countries.
66 (Rev. Dubai, 2018) Documents and publications of the Union All dispositions of this resolution are implemented. There has been no change or development on the issue of cost recovery and its basic principles. The provisions and principles laid down in Resolution 66 are still valid and pertinent.
91 (Rev. Guadalajara, 2010) Cost recovery for some ITU products and services See report to the Council on Cost Recovery for the processing of Satellite network Filings, document C20/16 and report to the Council by Chair of CWG-FHR, document C20/50.
99 (Rev. Dubai, 2018) Status of Palestine in ITU This Resolution was fully implemented and allowed the observer from the State of Palestine to continue to participate in all conferences, assemblies, and meetings organized under the aegis of ITU, in particular WRC-19, taking advantage of all of the rights enumerated in Resolution 99 (Rev. Dubai, 2018). The observer from the State of Palestine attended the 2019 ordinary session of the Council.
101 (Rev. Dubai, 2018) Internet Protocol-based networks See report to the Council document C20/33 and report to the Council by Chair of CWG-Internet, document C20/51.
119 (Rev. Antalya, 2006) Methods to improve the efficiency and effectiveness of the RRB The Board pursued its periodical review of the working methods and internal processes contained in Part C of the Rules of Procedure and decided not to modify them in 2019. The 80th, 81st, and 82nd RRB meetings were scheduled in 2019. The Summary of Decisions and the Minutes of each Board's meetings have been duly published on the RRB website within statutory time limits.

Status of Implementation
125 (Rev. Dubai, 2018) Assistance and support to Palestine for rebuilding its telecommunication networks • ITU had developed costing model [BU-LRIC] for fixed and mobile networks services [voice and data] for Palestine as well as price regulation framework. The cost model report is reviewed by ITU and Palestine and accepted. Next steps were agreed with Palestine which include the following: ➢ Organized a virtual workshop for the project team from Palestine, 9 April ➢ Plan A (original plan): - A mission to Ramallah to conduct a meeting with Palestine ICTs stakeholder to explain the construction and use of the cost models; - Training for MTIT on how best to use the model. ➢ Plan B (Possible alternative accounting for Covid-19): - An online stakeholder workshop; - An online training session for MTIT. • Project on "implementation of CIRT services and related capabilities" that reached its closure end of 2019, Palestine was assisted in building and deploying the technical capabilities and related trainings necessary to the implementation of the Palestine's CIRT; • In the framework of the connect school project 15 additional schools were equipped and connected to internet during 2018-2019; • The following assistance to Palestine was stalled due to the inability to issue a visa for scoping visits by experts and ITU staff: o establish a national electronic authentication unit; o developing smart learning policy review. • Started assistance to do a feasibility study for a satellite earth station. The draft job description for the required assistance was sent to Palestine in June and pending their feedback.
131 (Rev. Dubai, 2018) Measuring information and communication technologies to build an integrating and inclusive information society Implementation of this resolution is ongoing. Official data has been collected from Member States and disseminated in the World Telecommunication Indicators Database and the Statistical Yearbook. The data was analysed and published in Measuring Digital Development: Facts and Figures 2019. Capacity-building workshops were held, in support of Member States, in data collection and submission of quality data. The Expert Group on Telecommunication Indicators and the Expert Group on Household statistics (EGH) held their annual meetings. See section 3 for the actual measurement of Connect 2030 targets which come mainly from the work of BDT on this subject.
135 (Rev. Dubai, 2018) ITU's role in the durable and sustainable development of telecommunications/information and communication technologies, in providing technical assistance and advice to developing countries and in implementing relevant national, regional and interregional projects BDT Implemented updated the ITU Broadband Maps with information obtained from administrations, regulators, operators and public sources (viewable online). In 2019, the Map presents infrastructure information from 520 operators' networks and 21,806 nodes worldwide. The research on and representation of the transmission links has reached 3,720,687. Additionally, the following actions have been taken:

Status of Implementation
• The ITU Broadband Business Planning Toolkit has been published; • Assessment studies for ECOWAS on Conformance and Interoperability and EMF were prepared.
139 (Rev. Dubai, 2018) Use of telecommunications/information and communication technologies to bridge the digital divide and build an inclusive information society The ITU Broadband Maps have been enhanced in taking stock of worldwide connectivity and promote understanding and investment opportunities of network infrastructure. The public version of the interactive map is available online. In 2019, the broadband maps supported other global initiatives such as GIGA (see section 1.9), FIGI-Mexico, and the emergency communication map. Further developments includes network deployment estimation based on an ITU Regional Initiative model as well as an improved graphical interface and partnership on Investment opportunities mapping for the Eastern Europe. Broadband WiMax Network installed and operational in Burundi: 437 schools, hospitals and individuals are connected and benefiting from the Broadband operations as of December 2019. Broadband 4G Mobile WiMax Network installed and operational in Djibouti: 116 Schools (48), Hospitals (45) and/or Government Ministries/ Institutions (23) are connected and benefiting from the Broadband operations as of December 2019. Broadband 4G LTE Mobile Network installed and operational in 20 localities in Rural areas of the Kingdom of Eswatinii
151 (Rev. Dubai, 2018) Implementation of results-based management in ITU See the 4-year rolling Operational Plan for the Union 2021-2024 here, and Section 3 . It should be noted that the 2020-2021 Budget adopted by Council 2019 follows the RBB principles.
154 (Rev. Dubai, 2018) Use of the six official languages of the Union on an equal footing See report to Council by Chair of CWG-LANG document C20/12
157 (Rev. Dubai, 2018) Strengthening the project execution and project monitoring functions in ITU ITU projects are making an impact in transforming the lives and livelihood of people in all corners of the world. Sustainable and innovative ICT solutions are deployed through these projects to foster development. BDT is well-recognized for its long-standing experience in ICTs for development projects that are designed according to on-the-ground needs. For continuous improvement in project execution, further investments into BDT tools, methodologies, guidelines, templates, standards and database development, and training related to projects and project management remained a priority. In line with results-based management and the principles of transparency, ITU projects website has been enhanced to dynamically display the overall status of BDT projects at any given time. In addition, projects case studies, post implementation assessment reports and videos have been further developed as a way of increasing the sharing of experiences and lessons learned. A new ITU Project Management Manual has been developed and is under finalization, which is based on Project Management Development Pro (PMD-Pro). BDT held a training on project management from 18-22 November 2019 and 39 staff passed the examination and are now certified as Project Management for Development Professionals - Level One (PMD Pro 1). In 2020, a second batch of ITU staff will be trained on PMD-Pro, and some staff will then become trainers to train others. Through this train-the-trainer approach, it is planned that all BDT project managers will be trained on PMD-Pro. The use of this manual is expected to enhance all phases of project management from identification, design and setup to implementation, monitoring, evaluation and control to end of project transition. This will lead to better accountability for the achievement of project results and impact.

Status of Implementation
160 (Rev. Dubai, 2018) Assistance to Somalia ITU and Somalia had singed a FCA and the related Programme Action Plan (PAP) was developed. Implementation started according to the top priorities identified by Somalia. • Assisted Somalia and developed a national ICTs Policy and Strategy (2019-2024). The report sets out the 5-year 2019-2024 National ICT Policy and Strategy which provides the framework needed to leverage the benefits of ICTs to support the social and economic development of Somali society; SMS4DC to enhance utilization and management of spectrum (5 keys provided).
161 (Antalya, 2006) Assistance and support for the Democratic Republic of Congo for rebuilding its telecommunication network Following the successful completion of the Broadband Access Masterplan Project by ITU and supported by the Ministry of Science, ICT and Future Planning (MSIP), Republic of Korea, a project to implement a Broadband Wireless Network in Kinshasa which is the most densely populated city in DRC. The proposal is still pending approval of the Government of DRC.
162 (Rev. Busan, 2014) Independent Management Advisory Committee IMAC submitted its Eight Annual Report to the Council in June 2019 (Doc. C19/22). All IMAC meeting reports and related documents are available at the IMAC public website here, while IMAC's Ninth Annual Report to Council is available in Doc.C20/22. The selection process for the new members of IMAC was concluded during the 2019 Session of Council: the new members of IMAC were recommended to Council 2019 by the IMAC Selection Panel through their Report to Council (Doc. C19/49), and the new members were appointed by Council by the Decision 615 (Appointment of members to the Independent Management Advisory Committee (IMAC) - Doc. C19/132). The new members of IMAC initiated their term on 1st of January 2020 and already participated in the CWG-FHR meeting in February 2020.
165 (Rev. Dubai, 2018) Deadlines for the submission of proposals and procedure for the registration of participants to conferences and assemblies of the Union The revision of this resolution was put into practice during WRC-19 meeting, where the deadline of submission for contributions was set for 30 September 2019. This has not only ensured the timely translation of all contributions submitted but has also significantly reduced overtime worked during the conference. This had positive implications on the conference's budget as well as C&P's budget.
167 (Rev. Dubai, 2018) Strengthening and developing ITU capabilities for electronic meetings and means to advance the work of the Union See report to Council (Doc. C20/53); see also section 1.8 on COVID-19 related activities/responses.
173 (Rev.Guadalajara, 2010) Piracy and attacks against fixed and cellular telephone networks in Lebanon After the assistance provided to Lebanon to assess the readiness in view of establishing a National Computer Incident Response Team (CIRT), a project to assist Lebanon in the establishment of its national CIRT has been signed in 2014 in which Lebanon was committed to fund part of this project and ITU/ARO secured the remaining funds for the project. The implementation has been held and the project concluded upon the request of Lebanon. Assistance on spectrum-related aspects, including frequency notification and coordination, technical examinations, transition to digital broadcasting, the digital dividend and the allocation of spectrum and licensing has been provided.

Status of Implementation
175 (Rev. Dubai, 2018) Telecommunication/information and communication technology accessibility for persons with disabilities and persons with specific needs See section 1.7 – Digital Inclusion
176 (Rev. Dubai, 2018) Measurement and assessment concerns related to human exposure to electromagnetic fields ITU-T Study Group 5 on "Environment, climate change and circular economy" is the lead ITU-T Study Group on studies on electromagnetic compatibility, lightning protection and electromagnetic effects. ITU-T SG5 within Working Party 1 on "EMC, lightning protection, EMF" has revised Recommendations ITU-T K.91 "Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields" and 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". ITU-T SG5 has approved Recommendation ITU-T K.145 "Assessment and management of compliance with RF EMF exposure limits for workers at radiocommunication sites and facilities". This Recommendation includes guidance on the protection of workers against radio frequency electromagnetic fields (RF-EMFs) exposure in their working environments and provides minimum general safety guidance for telecommunication RF workers around the world. The development of this Recommendation was led by SME that was participating in the SME pilot project. Additionally, ITU-T SG5 revised ITU-T K.Suppl.14 to ITU-T K-series on The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment, in order to include a new chapter that compares the results of measurements between countries with different exposure limits. SG5 also revised ITU-T K.Suppl.9 on 5G technology and human exposure to RF EMF and ITU-T K.Suppl.16 on Electromagnetic field compliance assessments for 5G wireless networks. A new Supplement on ITU-T K.Suppl.19 on EMF strength inside subway train. ITU-T SG5 organized a Forum on Human Exposure to Electromagnetic Fields in Africa on 29 August 2019 in Abuja, Nigeria, which was held during the First Digital African Week 2019. ITU is regularly represented in WHO meetings relating to EMF. Similarly, WHO representatives regularly participate in meetings and workshops dealing with EMF, which are organized by ITU.
177 (Rev. Dubai, 2018) Conformance and interoperability [also WTSA Res. 76 and WTDC Res. 47] ITU made progress implementing the ITU Conformance and Interoperability Programme (C&I) including: • TSB maintains the "ICT product conformity database" which enables industry to publicize the conformance of ICT products and services to ITU-T Recommendations, assisting users in their efforts to select standards-compliant products. As of January 2020, the database contains five categories of ICT products accumulating more than 500 entries. • ITU-T updates the list of ITU-T Recommendations suitable for C&I testing based on inputs provided by all ITU-T SGs. • TSB Secretariat facilitates the implementation of ITU Testing Laboratory recognition procedure on ITU-T Recommendations. TSB participated in IECEE Task Force meeting which aim was to finalize the new Operational Document of IECEE (OD) "ICT Laboratory Recognition Service on ITU-T Recommendations". This service is based on IECEE peer assessment processes by using ITU-T Recommendations, based on the IECEE peer assessment program involving ITU-T technical experts nominated by ITU-T Conformity Assessment Steering Committee (CASC). Following the approval of this OD by IECEE, any Testing Laboratory (TL) (including non-ITU members) may apply for such recognition. • In October 2019, ITU-T CASC appointed 11 Technical experts who have competence on different ITU-T Recommendations. Those experts might be involved by IECEE for TL assessment.

Status of Implementation
• Following the request received from IECEE and SG11 decision, TSB disseminated a questionnaire on evaluation of market needs for joint ITU/IEC TL recognition procedure and certification schemes on ITU-T Recommendations (TSB Circular 208). The aim of the questionnaire was to evaluate the market needs of the in-progress joint ITU/IEC work to establish a peer assessment laboratory service (testing laboratory recognition procedure) and the joint conformity assessment program (joint ITU/IEC certification schemes) on ITU-T Recommendations. There were 21 respondents who provided feedback. According to the results of the survey, most of the replies are positive and the outcomes show interest of different stakeholders to the new joint ITU/IEC services. In this regard, CASC was committed to continuing collaboration with IECEE on TL recognition procedure and joint certification schemes. • CASC requested IECEE to set up a joint ITU/IEC certification schemes for several ICT technologies with strong demands in the ICT market (e.g. safe listing, video surveillance, accessibility features in IPTV systems); • The third ITU-T Study Group 11 Regional Workshop for Africa on "Counterfeit ICT Devices, Conformance and Interoperability Testing Challenges in Africa" took place in Tunis (Tunisia) on 30 September 2019, followed by the ITU-T SG11 Regional group meeting for Africa (SG11RG-AFR). • On the ITU C&I Programme Pillar 3 - Capacity Building: o On-the-job Capacity Building activities conducted for AFR and ARB regions on C&I frameworks and different Testing Domains (e.g. IoT, 5G,C&I and SAR) provided in collaboration with laboratory partners and Centres of Excellence (CERT, CAICT, and NCA/Ghana). More details available here https://itu.int/go/ci_training. o A Conformance and Interoperability Training Programme (CITP) development has started. CITP is based on training materials produced by previous C&I training events, such as Regional Trainings on C&I Programmes and test domains, It also takes into consideration the learnings from ITU Publications on C&I, e.g. Q4/2 Report (2017); and published ITU Guidelines and Recommendations (https://itu.int/go/ci_guidelines). CITP development is following ITU Academy quality assurance mechanism, which includes: a full set of high-level; materials prepared by subject-matter experts; and per-reviewing process. • Related to the ITU C&I Programme Pillar 4-assistance to developing countries: in 2019, C&I Assessment Studies aiming to promote collaboration in regional organizations for establishing a harmonic C&I Programmes were conducted in the ECOWAS region. • ITU-D Study Group 2 Question 4 – "Assistance to developing countries for implementing conformance and interoperability (C&I) programmes and combating counterfeit ICT equipment and theft of mobile devices" presented its partial report during the Rapporteur Group held on 26 February 2020. 77 input documents are under consideration. For more information: http://itu.int/go/Q4/2.
179 (Rev. Dubai, 2018) ITU's role in child online protection See report to Council by Chair of CWG-COP here, and section 1.6.
182 (Rev. Busan, 2014) The role of telecommunications/information and communication technologies in regard to climate change and the protection of the environment ITU-T SG5 on "Environment, climate change and circular economy" is the lead Study Group on ICTs related to the environment, climate change, energy efficiency, clean energy, and circular economy, including e-waste. Sections 1.3 and 1.5 provide details on specific climate-related recommendations approved during this period.

Status of Implementation
ITU-T SG5 organized the following events: • 9th Green Standards Week, 1-4 October 2019, Valencia, Spain; • ITU Telecom World: Session on "Strategies to boost climate action in the ICT sector", 11 September 2019, Budapest, Hungary; • ITU Telecom World: Session on "Frontier technologies for climate change11 September 2019, Budapest, Hungary; • HLPF Side Event: "Harnessing Frontier Technologies for Accelerating Climate Actions and the SDGs", 9 July 2019, New York, UNHQ; • Smart Environment Panel on GHG emissions trajectories for the ICT sector, 15 May 2019, Geneva, Switzerland; • 13th Symposium on ICT, Environment and Climate Change, 13 May 2019, Geneva, Switzerland; • STI Forum Side Event: Frontier Technologies to Protect the Environment and Tackle Climate Change, 14 May 2019, New York, UNHQ. Additionally, the ITU-T Focus Group on Environmental Efficiency for AI and other emerging technologies (FG-AI4EE) develops technical reports and technical specifications to address the environmental efficiency, as well as water and energy consumption of emerging technologies. See section 1.4.
184 (Guadalajara, 2010) Facilitating digital inclusion initiatives for indigenous peoples See section 1.7.
186 (Rev. Dubai, 2018) Strengthening the role of ITU with regard to transparency and confidence-building measures in outer space activities See section 1.9.
188 (Rev. Dubai, 2018) Combating counterfeit telecommunication/information and communication technology devices In March 2019, following Member States consultation (Resolution 1 of WTSA-16), ITU-T SG11 approved new Recommendation ITU-T Q.5050 “Framework for solution to combat counterfeit ICT devices” which contains the reference framework and requirements to be considered when deploying solutions to combat the circulation and use of counterfeit ICT devices. TSB is organizing Regional Workshops on combating counterfeiting ICT devices. The third ITU-T Study Group 11 Regional Workshop for Africa on “Counterfeit ICT Devices, Conformance and Interoperability Testing Challenges in Africa” took place in Tunis (Tunisia) on 30 September 2019, back-to-back with the ITU-T SG11 Regional group meeting for Africa (SG11RG-AFR). SG11RG-AFR considered a necessity to begin extensive discussion within the region for implementation of strategies for combating counterfeiting mobile devices and fraud. This decision was based on the draft contribution “Framework on combating counterfeit and stolen ICT mobile devices in Africa region” which was discussed at the SG11RG-AFR meeting and further submitted to SG11 meeting (October 2019). In this regard, there is call for African regulators associations to arrange a joint meeting in order to set up a common strategy based on the proposed technical report. This approach will help all Members States of the Africa region to protect innovations, brands and genuine products in the market and support products circulation to protect health, safety and security of consumers in the Africa region.

Status of Implementation
Following the decision of Council-18 *(C18/107, clause 2)*, ITU, in particular TSB, should be studying the questions raised by members on IMEI security in one of the ITU-T study groups. Council-18 report *(C18/107)* requested *"ITU-T study groups, in particular Study Group 11, to continue to develop Recommendations, technical reports and guidelines to address the problems posed by counterfeits"*. In this regard, following the contribution received and the report prepared by TSB, ITU-T SG11 decided to start a new work item TR-RLB-IMEI "Reliability of IMEI identifier". This technical report contains a study about key vulnerabilities on IMEI reprogramming on mobile devices and proposals to improve IMEI reliability. SG11 started two new work items: • Draft Recommendation ITU-T Q.Bl-Audit "Audit interface for blacklisting IMEI" which defines the interfaces between blacklist provider audit system and Telecom Service Provider's Equipment Identity Register (EIR) to audit and reconcile whether the TSP is complying with the Blacklist provided by the competent entity; • Draft Recommendation ITU-T Q.DEV_DUI "Addressing ICT mobile devices with duplicate unique identifiers" which describes mechanisms to enable detection of duplicate or cloned mobile devices present on operator networks, as well as mechanisms for validating the legitimacy of such devices once detected. Furthermore, this document discusses mechanisms for identifying devices with duplicate device identifiers across countries. ITU-D Q4/2 and BDT related work: from the ITU World Telecommunication/ICT Regulatory Survey on regulatory practices there are five related questions related to the distribution and use of counterfeit ICTs. The data series featured are as follows: 1) Responsibilities of telecom/ICT regulators related to ICT counterfeiting, 2) Types of counterfeit ICTs overseen by the telecom/ICT regulator, 3) Policy/legislation/regulation related to ICT counterfeiting adopted, 4) Areas covered in ICT counterfeiting regulations, 5) Plans to adopt a regulatory framework for ICT counterfeiting.
190 (Busan, 2014) Countering misappropriation and misuse of international telecommunication numbering resources Recommendation ITU-T E.156 (revised) "Guidelines for ITU-T action on reported misuse of E.164 number resources" was Determined by ITU-T SG2 in December 2020, with Approval planned at the next meeting of the study group in May/June 2020 (SG2-R19). SG2 is progressing a technical report TR.EENM "Guidelines for effective and efficient national numbering resources administration". The following related event took place: • ITU Regional Standardization Forum (RSF) on "Addressing Competition Issues in ICT Economy", Colombo, Sri Lanka, 1 October 2019. • ITU Inter-regional Standardization Forum on "Operational issues on numbering, emergency service and OTTs", Dubai, United Emirates on 22 October 2019. • ITU Regional Workshop on ITU International Numbering Resources (INRs) for the Americas region was held from 25 to 26 March 2019 and was followed by the meeting of ITU-T Study Group 2 Regional Group for the Americas (SG2RG-AMR).
193 (Busan, 2014) Support and assistance for Iraq to rebuild its telecommunication sector At the request of Iraq, emphasis has been put on assisting with the newly adopted Resolution 211. Assistance for the actual rebuilding of infrastructure was not possible in past years due to the security situation on the ground.
197 (Rev. Dubai, 2018) Facilitating the Internet of Things and smart sustainable cities and communities

Status of Implementation	
Since March 2019, ITU-T Study Group 20 developed a series of Recommendations and other deliverables including:	
Work item	**Title**
Y.4461 (ex Y.SC-OpenData)	Framework of open data in smart cities
	Internet of Things and smart cities and communities standards roadmap
Y.4206 (ex Y.UCS-reqts)	Requirements and capabilities of user-centric work space service
Y.4207 (ex Y.SEM)	Requirements and capability framework of smart environmental monitoring
Y.4208 (ex Y.IoT-EC-reqts)	IoT requirements for support of edge computing
Y.Suppl.56 (ex Y.Sup.SCC-Use-Cases)	Use cases of smart cities and communities
Y.4460 (ex Y.dev-IoT-arch)	Architectural reference models of devices for IoT applications
Y.4462 (ex Y.IoT-ics)	Requirements and functional architecture of open IoT identity correlation service
Y.4467 (ex Y.AERS-msd)	Minimum set of data structure for automotive emergency response system
Y.4468 (ex Y.AERS-mtp)	Minimum set of data transfer protocol for automotive emergency response system
Y.4458 (ex Y.SSL)	Requirements and functional architecture of smart street light service
Y.4463 (ex Y.del-fw)	Framework of delegation service for IoT devices
Y.4464 (ex Y.IoT-BoT-fw)	Framework of blockchain of things as decentralized service platform
Y.4465 (ex Y.IoT-VLC)	Framework of IoT Services based on Visible Light Communications
Y.4466 (ex Y.ISG-fr)	Framework of smart greenhouse service
Y.4556 (ex Y.SC-Residential)	Requirements and functional architecture of smart residential community
Y.Suppl.57 to ITU-T Y.4409 (ex Y.Sup.4409)	Implementation Guidelines to Recommendation ITU-T Y.4409
Y.4051 (ex Y.SCC-Terms)	Vocabulary for smart cities and communities
Y.Sup.54 to ITU-T Y.4000-series (ex Y.HEP)	Framework for home environment profiles and levels of IoT systems
Y.4459 (ex Y.IoT-Interop)	Digital entity architecture framework for IoT interoperability
Y.4807 (ex Y.IoT-Agility)	Agility by design for Telecommunications/ICT Systems Security used in the Internet of Things
Y.4904 (ex Y.SSC-MM)	Smart sustainable cities maturity model
Y.4906 (ex Y.AFDTS)	Assessment framework for digital transformation of sectors in smart cities

Status of Implementation
In October 2019, Recommendations ITU-T Y.4200 "Requirements for the interoperability of smart city platforms" and ITU-T Y.4201 "High-level requirements and reference framework of smart city platforms" were named as 2019 Catalyst Awards finalists of the Green Electronics Council. A Joint IEC-ISO-ITU Smart Cities Task force was created with the objective to build synergies on ongoing work in ITU-T, IEC and ISO related to smart cities and communities; to maximize efforts in order to identify new areas of cooperation related to smart cities and communities; and to develop a holistic view on smart cities and communities taking into consideration the scope, areas of work and expertise of ITU-T, IEC and ISO to support smart cities and communities development. ITU-T SG20 continues to collaborate closely with oneM2M. The next SG20 meeting will be co-located with the meeting of oneM2M from 6 to 16 July 2020 in Geneva, Switzerland. The Joint Coordination Activity on Internet of Things and Smart Cities and Communities (JCA-IoT and SC&C) held two meetings on 10 April 2019 and on 28 November 2019. The next JCA-IoT and SC&C meeting will take place on 8 July 2020. As a result of the inputs provided during JCA meetings, the new Supplement ITU-T Y.Suppl.58: Internet of Things and smart cities and communities standards roadmap was agreed by ITU-T SG20 in December 2019. A series of events organized by TSB with UN bodies and other partners took place since March 2019. See here. A Year in Review and Upcoming Activities 2019-2020 Brochure was published in January 2020. The "United for Smart Sustainable Cities" (U4SSC) is a UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by CBD, ECLAC, FAO, ITU, UNDP, UNECA, UNECE, UNESCO, UN Environment, UNEP-FI, UNFCCC, UNIDO, UNU-EGOV, UN-Women, UNOPS and WMO to achieve Sustainable Development Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable". Since March 2019, U4SSC held over 50 e-meetings to progress the work carried out in the U4SSC Thematic Groups. A Call for Experts to get involved in the United for Smart Sustainable Cities (U4SSC) initiative's key thematic groups to pinpoint the solutions, technologies and policy tools that will forge smart sustainable cities and communities was launched in March 2020. The U4SSC City Science Application Framework was published in October 2019 together with 8 case studies. It provides a four-step methodology for cities to solve their pressing urban challenges. By using empirical evidence as the basis for evaluation, the city science application framework offers a reliable and consistent way for cities to assess, prioritize and boost their city applications. The U4SSC initiative's Implementation Programme was created in October 2019 with the objective to carry out projects and build partnerships, which aim to build smarter and more sustainable cities worldwide. The U4SSC developed a set of international key performance indicators (KPIs) for Smart Sustainable Cities (SSC) (based on Recommendation ITU-T Y.4903) to establish the criteria to evaluate ICT´s contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments in order to achieve the sustainable development goals (SDGs). Over 100 cities worldwide are already implementing these KPIs and the last city that joined the KPI project in February 2020 is the city of Ambato in Ecuador. In September 2019, the Verification Report: Pully under the microscope was published. In October 2019, a series of City snapshots were published [Ålesund, Norway] [Bizerte, Tunisia] [Moscow, Russia] [Riyadh, Saudi Arabia] [Pully, Switzerland]. In March 2020, a series of Factsheets of the Cities of Alesund, Valencia and Bizerte were published.

Status of Implementation
198 (Rev. Dubai, 2018) Empowerment of youth through telecommunication/information and communication technology See section 1.7
200 (Rev. Dubai, 2018) Connect 2030 Agenda for global telecommunication/information and communication technology, including broadband, for sustainable development This report can be considered as a report on the implementation of the Connect 2030 Agenda (see section 3).
204 (Rev. Dubai, 2018) Use of information and communication technologies to bridge the financial inclusion gap Pursuant to WTSA-16 Resolution 89, ITU has implemented a number of activities aimed at enhancing the use of ICTs in bridging the financial inclusion gap through the following: a. The Financial Inclusion Global Initiative (FIGI) b. The ITU-T Study Groups and Focus Groups work programme c. ITU- D Policy and Regulation Programme **Financial Inclusion Global Initiative (FIGI)** FIGI was established in 2017 as a three-year programme of collective action to advance research in digital finance and accelerate digital financial inclusion in developing countries. FIGI is led jointly by ITU, the World Bank Group and the Committee on Payments and Market Infrastructures, with support from the Bill & Melinda Gates Foundation. FIGI funds national implementations in three countries, namely China, Egypt and Mexico, and has three Working Groups: (1) Electronic Payment Acceptance, (2) Digital ID Working Group led by the World Bank, and (3) Security, Infrastructure and Trust Working Group (SIT WG) led by ITU. ITU implemented the following activities under FIGI umbrella in 2019: • Organization of the second edition of FIGI Symposium, in Cairo, Egypt (21-24 January 2019) • FIGI Hackathon during the FIGI Symposium • The FIGI SIT WG produced 8 technical reports which were disseminated to the ITU-T Study Groups for incorporation in their standardization work • FIGI Security Clinic was held on 4-5 December 2019 at ITU to present the findings of the SIT WG. **FIGI Symposium and Hackathon** The FIGI Symposium and Hackathon were held on 21-24 January 2019, in Cairo, Egypt. The event attracted some 289 participants from Central Banks, telecom regulators, DFS providers, payment service providers and fintech companies. Most participants were from developing countries. The theme of the second edition of the FIGI Symposium, was **Enabling an Inclusive DFS Ecosystem: National and Thematic Insights**. **FIGI Security Clinic** A FIGI Security Clinic was held on 4-5 December 2019 at ITU Headquarters to present the outputs of the FIGI SIT WG and provide some deep dive sessions on the implementation of the findings from the working group reports. Over 80 participants, mainly IT Security professionals, attended the event.

Status of Implementation

The first day sessions focused on the presentations of the reports of the Security, Infrastructure and Trust Working Group. The second day of the event consisted of a series of security clinics targeting mainly those who are actively involved in technical security implementation in the area of digital financial services.

FIGI Security, Infrastructure and Trust Working Group

The Security, Infrastructure, and Trust Working Group held two face-to-face meetings and 28 e-meetings in 2019.

SIT WG finalized eight technical reports in 2019 (which are available for download on the FIGI SIT Working Group webpage):

i. Unlicensed digital investment schemes,
ii. Security aspects of Distributed Ledger Technologies (DLT),
iii. Mitigating SS7 Security Vulnerabilities,
iv. Methodology for measurement of KPIs for QoS for DFS,
v. Data Privacy issues of emerging technologies for DFS,
vi. DFS Security Assurance Framework and
vii. Strong Authentication Technologies for DFS.
viii. Developer resources for implementation of FIDO Universal Authentication Framework (UAF) in DFS.

The methodology for measurement of KPIs for QoS for DFS was submitted to ITU-T Study Group 12 and was subsequently approved as an ITU-T Recommendation in December 2019. The report Mitigating SS7 Security Vulnerabilities was submitted to ITU-T Study Group 11 and led to the creation of a work item on this topic. Work is now underway to develop a technical standard on mitigating SS7 vulnerabilities for DFS in ITU-T Study Group 11. The reports on DLT Security, DFS Security Assurance Framework and Strong Authentication Technologies have been transferred to ITU-T Study Group 17 where they will be incorporated as technical reports in the standards being developed by the Study Group.

An additional six technical reports would be developed by the SIT Working Group in 2020:

- Best practices for mitigating vulnerabilities of DFS applications operating in USSD and STK environments;
- Best practices for mitigating vulnerabilities of DFS applications under Android
- Methodology for measurement of Quality of Service parameters for interoperability and cross border mobile money payment use cases
- DFS Competency Framework and
- Distributed Ledger Technologies (DLT) legal aspects
- APIs in Digital Finance.

Country Implementation

Country implementation focuses on the implementation of enabling policy and regulatory frameworks to leverage ICTs for Digital Financial Inclusion, integrating ITU-T FG DFS Recommendations, Payment Aspects of Financial Inclusion (PAFI) recommendations, and Level One Principles. Country implementation is currently taking place in Mexico, Egypt and China.

Standardization Activities in ITU-T Study Groups and Focus Groups related to DFS

Focus Group Digital Currency including Digital Fiat Currency

The ITU-T Focus Group Digital Currency including Digital Fiat Currency (FG DFC) was established by TSAG at its meeting of May 2017 and completed its work in June 2019.

Status of Implementation

The main objectives of the Focus Group are to Investigate the ecosystem of digital fiat currency implementation for financial inclusion, identify use cases, requirements and applications of digital fiat currency, study the economic benefit and impact of introducing DFC over mobile money and identify new areas for standardization in ITU-T study groups.

The focus group produced seven technical reports under three themes (see table below):

Theme	Deliverable
Regulatory Requirements and Economic Impact of Central Bank Digital Currency	Reference Documentation for governance related aspects for digital fiat currency [DFC-O-010]
	Digital Currency Implementation Checklist for Central Banks [DFC-O-005]
	Regulatory Challenges and Risks for Central Bank Digital Currency [DFC-O-006]
Reference Architecture	Taxonomy and definition of terms for DFC [DFC-O-012]
	Reference Architecture and Use Cases for Central Bank Digital Currency [DFC-O-014]
Security	Protection Assurance for Digital Currencies [DFC-O-008]
	Protection Assurance Use Case for a Payment Transaction [DFC-O-009]

The reports of the Focus Group have been forwarded by TSAG to the ITU-T Study Groups 3 for information and to ITU-T Study Groups 16 and 17 for integration in their standardization work.

ITU-T Study Group 3

During the ITU-T SG3 meeting in April-May 2019, Recommendation ITU-T D.263, "Costs, charges and competition for mobile financial services (MFSs)" was approved.

Additionally, a series of reports of the Focus Group on Digital Financial Services (FG-DFS) were approved to be published as SG3 Technical Reports.

ITU-T Study Group 11

SG11 agreed the Technical report ITU-T TR-SS7-DFS "SS7 vulnerabilities and mitigation measures for digital financial services transactions" which is based on the report approved by FIGI.

SG11 achieved progress on the ongoing draft Recommendation ITU-T Q.SR-Trust "Signalling requirements and architecture for interconnection between trustable network entities" which defines the signalling architecture and requirement for interconnection between trustable network entities in support of existing and emerging networks.

In October 2019, SG11 organized a Brainstorming session on SS7 vulnerabilities and the impact on different industries including digital financial services. The objective of the event was to discuss the potential way forward to enhance the security mechanisms of existing protocols and its adoption rate among telecom operators in order to defend all stakeholders such as Telco operators, banks, operators of financial services, regulators and individual clients from related attacks.

Status of Implementation
In March 2020, SG11 finalized and consented the baseline text of ITU-T Q.3057 (ex. Q.SR-Trust) "Signalling requirements and architecture for interconnection between trustable network entities". Also, following SG11 Brainstorming session on SS7 vulnerabilities, SG11 started draft technical report on Low resource requirement, quantum resistant, encryption of USSD messages for use in financial services, which purpose is to examine new technologies for encryption of USSD in End-to-End manner and estimate its applicability to be integrated into existing USSD technology, suggesting new recommendation and signalling requirements for the integration of such technology into the existing reference architecture. **ITU-T Study Group 12** Two new ITU-T Recommendations were approved on digital financial services: 1. New Recommendation ITU-T G.1033 highlights important aspects related to quality of service (QoS) and quality of experience (QoE) that require consideration in the context of digital financial services. 2. New Recommendation ITU-T P.1502 introduces a methodology for testing the quality of experience (QoE) of digital financial services. The Recommendations are based on the results of the ITU-T Focus Group on Digital Financial Services and the FIGI Security, Infrastructure and Trust Working Group. **ITU-T Study Group 16** The new Question 22/16 on Distributed ledger technologies (DLT) and e-services continues part of the work of the now closed ITU-T Focus Group on distributed ledger technologies. DLT are building blocks to many verticals, there included digital financial services, in particular when a trusted third party is not involved. Topics of interest for DFS that are being studied by Q22/16 include digital evidence services, digital invoices and smart contracts. Two technical papers have been approved in October 2019: • HSTP.DLT-UC: Distributed ledger technologies: Use cases • HSTP.DLT-RF: Distributed ledger technology: Regulatory framework. Updated information can be found here. **ITU-T Study Group 17** FinTech revolution has disrupted the status quo, modernized old institutions, and changed the way for consumers to access financial products and services. Interfaces between FinTech startups and traditional providers are a common source of cyber vulnerabilities. ITU-T SG17 is developing technical and procedural specifications to ensure risk-based security management are implemented in every lifecycle stage, component and interface of FinTech systems and services. The following work items are now under development: • X.sfop: Security framework of open platform for FinTech services • X.str-dlt: Security requirements for digital payment services using distributed ledger technology. **ITU- D Policy and Regulation Programme** ITU-D provides country assistance to build capacity and guide countries through digital financial inclusion, focusing in particular on leveraging ICTs for digital financial inclusion. Within this context, in 2017, ITU assisted Mongolia by assessing and providing guidance on Digital Financial Services (DFS) and Digital Financial Inclusion (DFI) Ecosystem in Mongolia and Sudan, providing country analysis and recommendations with focus on cross-sectoral policy and regulatory collaboration.

Status of Implementation
ITU-D also provides capacity building for regulators and other administration officials such as training on digital payments and the ecosystem to India, and on Distributed Ledger Technologies to Asia Pacific countries in Thailand in 2018. In addition, the Global Dialogue on Digital Financial Inclusion (GDDFI) is part ITU's activities to foster and strengthen collaborative regulation between ICT regulators and regulators from other sectors, focusing on the financial sector**.** Launched during the Global Symposium for Regulators (GSR) in 2016, GDDFI brought together telecom/ICT and financial regulators from around the world to establish a constructive global dialogue on topical issues of relevance to stakeholders from both sectors. GDDFI identified the following policy, regulatory, and business collaborative guiding measures to move forward the digital financial inclusion agenda by building synergies at the national, regional and global levels (available here and report available here).
206 (Dubai, 2018) OTTs ITU-T Study Group 3 approved of a new ITU-T Recommendation addressing the relationship between network operators and providers of over-the-top (OTT) services. The new standard ITU-T D.262 on Collaborative Framework for OTTs provides parameters for the analysis of the new financial dynamics of the ICT ecosystem. It also focuses on how policy and regulatory frameworks could support competition, consumer protection, consumer benefits, dynamic innovation, sustainable investment and infrastructure development, accessibility and affordability in relation to the global growth of OTTs. SG3 is studying OTTs within several work items; ITU-T SG2 is progressing two work items on OTTs. An ITU Inter-regional Standardization Forum on "Operational issues on numbering, emergency service and OTTs", took place in Dubai, United Emirates on 22 October 2019.
207 (Dubai, 2018) ITU Journal: ICT Discoveries November 2019 saw the publication of the ITU Journal special issue on Propagation modelling for advanced future radio systems – Challenges for a congested radio spectrum, developed together with the Radiocommunication Bureau. The next special issue on The future of video and immersive media will be published in the Spring of 2020, and will address the state of the art in multimedia and related challenges, as well as provide a look into the historical developments of the JPEG and video coding technology. Building on the co-publishing agreement signed in 2018, ITU Journal and Tsinghua University Press have launched the new joint publication titled Intelligent and Converged Networks. Its first special issue will be published in April 2020.
211(Dubai, 2018) Support for the Iraqi Du3M 2025 initiative for advancement of the telecommunication and information technology sectors The ICT Accessibility Policy for Iraq was developed for Iraq in 2019. Furthermore, a series of four events were organized in Iraq as part of ITU-UNESCO Digital Inclusion Week that took place in Baghdad, Iraq from 22-25 September 2019. These events were as follows: • Digital Inclusion Forum in collaboration with UNESCO (22/9): the forum shed light on interesting projects and activities by key stakeholders from the Arab region. Around 150 participants participated. • National workshop on ICT Accessibility for Persons with Disabilities (23/9): the workshop was organized to present ITU's draft proposal for Iraq's national ICT Accessibility Policy. Around 30 participants participated. • National workshop on Smart Learning Policies in collaboration with UNESCO (24/9): the workshop was organized to shed light on key issues pertaining to smart learning policies. Around 30 participants participated.

Status of Implementation
• National workshop on cybersecurity for financial institutions (25/9): This capacity building workshop shed light on key issues that financial institutions should take care of in their mission to protect their critical ICT infrastructure. Around 50 participants participated. In addition to the above, there are a number of ongoing areas of assistance that have been stalled due to the instability in the region and globally. These include, development of a national cybersecurity strategy, raising awareness on child online protection, digital broadcasting, and e-waste statistics. This was all in line with the agreed implementation plan for the implementation of Resolution 211 with Iraq.
213 (Dubai, 2018) Measures to improve, promote and strengthen ITU fellowships A Draft revised policy for awarding fellowships for events and activities funded through the ITU regular budget and revised list of eligible countrie**s** were presented to the CWG-FHR (see here). Service Order No. 07/05 had been revised as well as its related list of eligible countries which is adapted from the United Nations annual report, *World Economic Situation and Prospects 2019*. The United Nations report 2020 was released on 16 January 2020, way after this document was posted on the Council Working Group website. In view of this, the changes noted in the UN report 2020 will be reflected in the list to be presented to the Council in June From March 2019 to March 2020, TSB provided 199 fellowships for the following meetings: • In Geneva: ITU-T Study Groups 2, 3, 5, 9, 11, 12, 13, 15, 16, 17, 20 and TSAG. • Outside Geneva: SG12RG-AFR (Kigali), SG13 (Zimbabwe), SG2RG-AMR and SG3RG-LAC (Nicaragua), SG17RG-AFR and SG17RG-ARB (Tunis), SG3RG-EECAT and SG11RG-EECAT and SG13RG-EECAT (Russia), SG5RG-AFR and SG20RG-AFR (Nigeria), SG11RG-AFR (Tunis), SG3RG-AO (Sri Lanka), SG2RG-ARB and SG2RG-AFR and SG3RG-ARB (UAE), C&I Training for Africa Region (Ghana), SG13RG-AFR (Nigeria). TSB received 377 requests. A total of 247 fellowships were awarded. Of that amount, 199 were used for a total of CHF 434’000.
Decision 5 (Rev. Dubai, 2018) Revenue and expenses for the Union for the period 2020-2023 See report to Council (Doc. C20/9) and report from the Chair of CWG-FHR

Annex 2 Outcomes of the work of the Union / Efficiency of Enablers

ITU-R Objectives

Objective R.1: Meet, in a rational, equitable, efficient, economical and timely way, the ITU membership's requirements for radio-frequency spectrum and satellite-orbit resources, while avoiding harmful interference

Outcomes

R.1-a: Increased number of countries having satellite networks and earth stations recorded in the Master International Frequency Register (MIFR)

R.1-b: Increased number of countries having terrestrial frequency assignments recorded in the MIFR

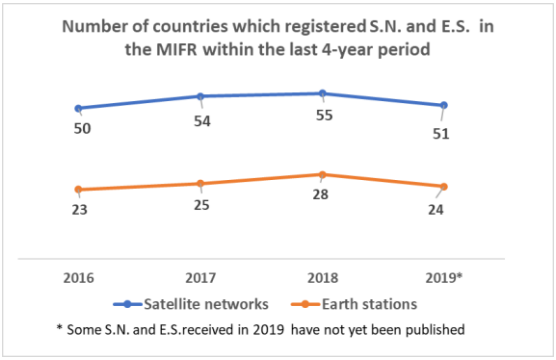
R.1-c: Increased percentage of assignments recorded in the MIFR with a favourable finding

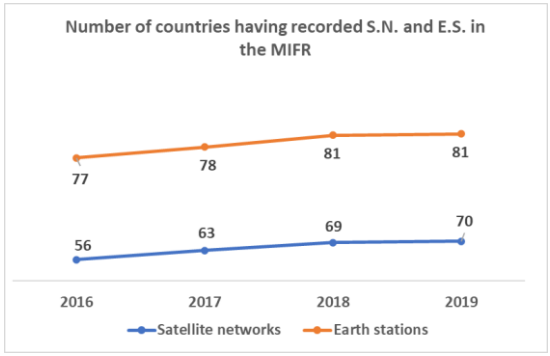
R.1-d: Increased percentage of countries which have completed the transition to digital terrestrial television broadcasting

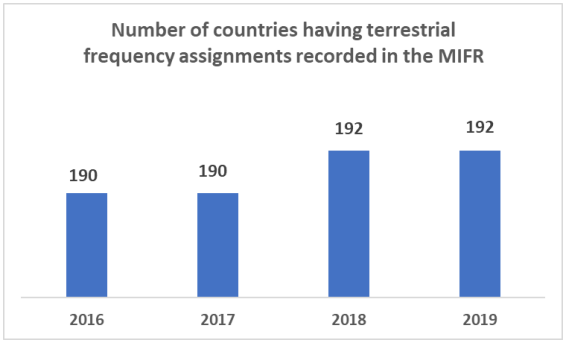
R.1-e: Increased percentage of spectrum assigned to satellite networks which is free from harmful interference

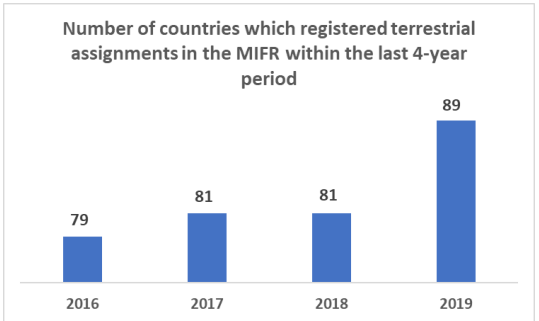
R.1-f: Increased percentage of assignments to terrestrial services recorded in the MIFR which are free from harmful interference

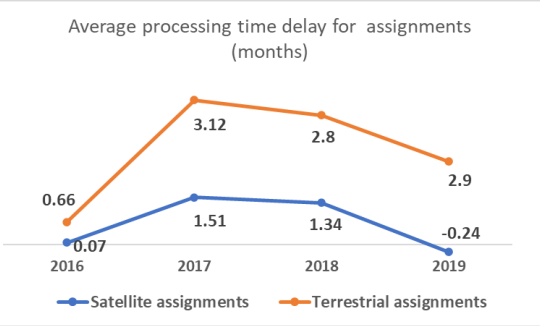
Progress achieved

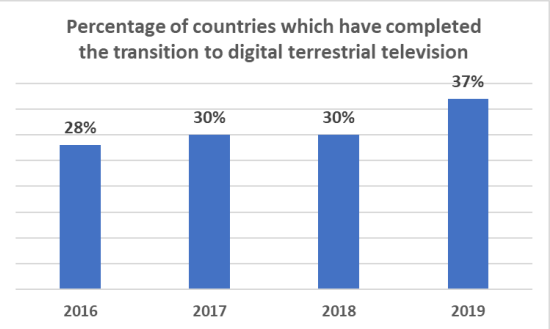


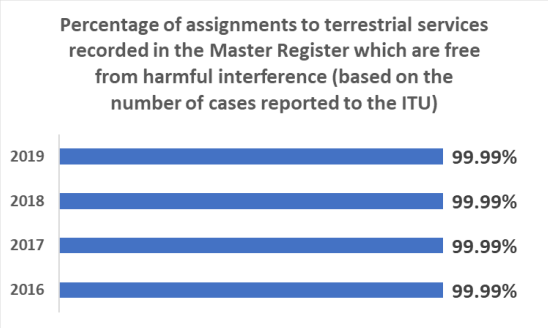


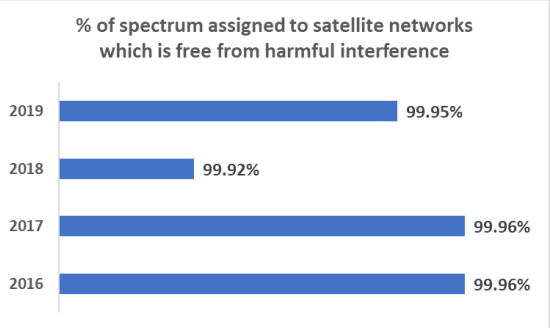












Objective R.2: (Radiocommunication standards) Provide for worldwide connectivity and interoperability, improved performance, quality, affordability and timeliness of service and overall system economy in radiocommunications, including through the development of international standards

Outcomes

R.2-a: Increased mobile-broadband access and use, including in frequency bands identified for international mobile telecommunications (IMT)

R.2-b: Reduced mobile-broadband price basket, as a percentage of gross national income (GNI) per capita

R.2-c: Increased number of fixed links and increased amount of traffic handled by the fixed service (Tbit/s)

R.2-d: Increased number of households with digital terrestrial television reception

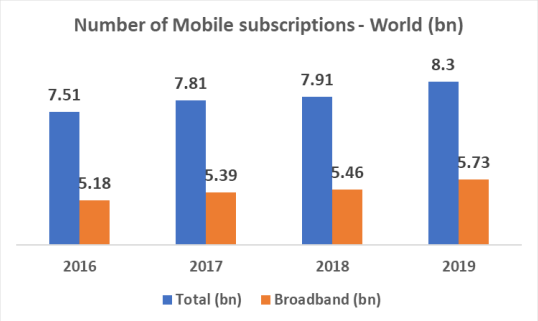
R.2-e: Increased number of satellite transponders (equivalent 36 MHz) on communication satellites in operation and corresponding capacity (Tbit/s); Number of VSAT terminals; Number of households with satellite television reception

R.2-f: Increased number of devices with radionavigation-satellite reception

R.2-g: Increased number of satellites having Earth exploration payloads in operation, corresponding quantity and resolution of transmitted images and data volume downloaded (Tbytes)

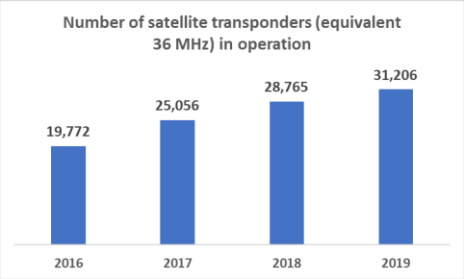
Progress achieved

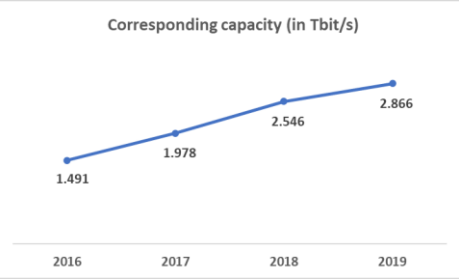
R.2a



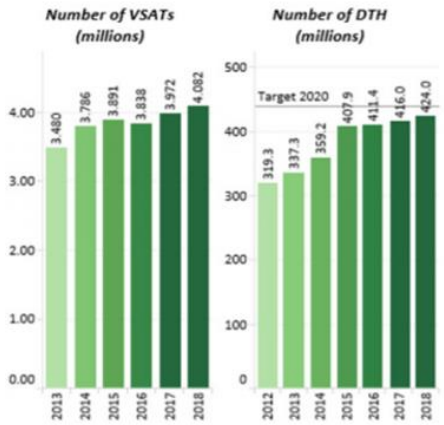
R.2b: See results for Strategic Targets 1.3, 2.5 and 2.6 in Section 3.1

R.2e

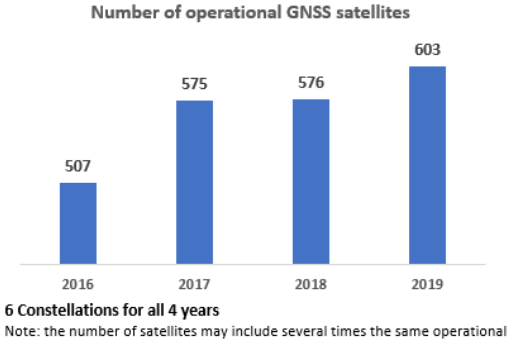




[Number of VSTs and DTH: 2019 values not available]

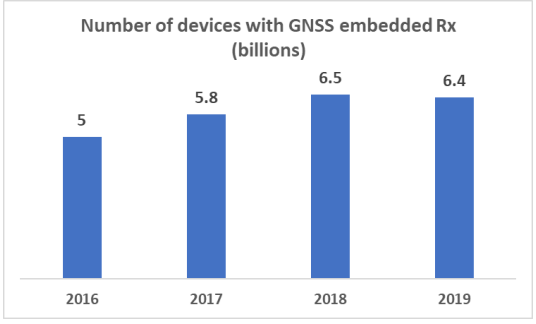


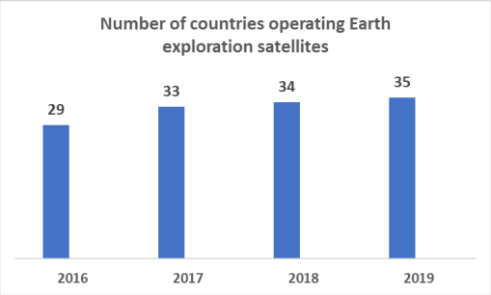
R.2f:

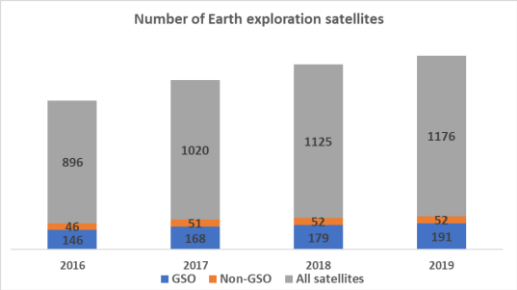


6 Constellations for all 4 years

Note: the number of satellites may include several times the same operational







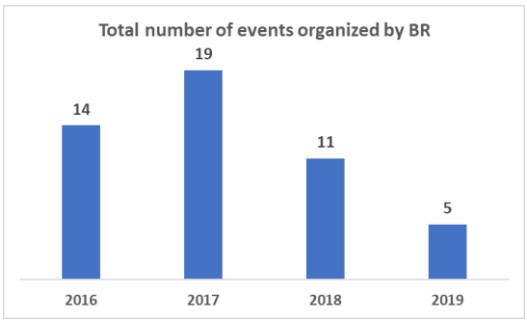
Objective R.3: (Knowledge sharing) Foster the acquisition and sharing of knowledge and know-how on radiocommunications

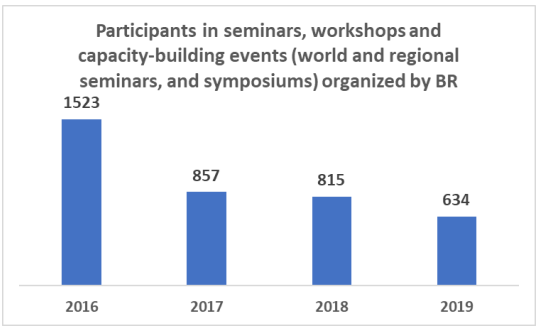
Outcomes

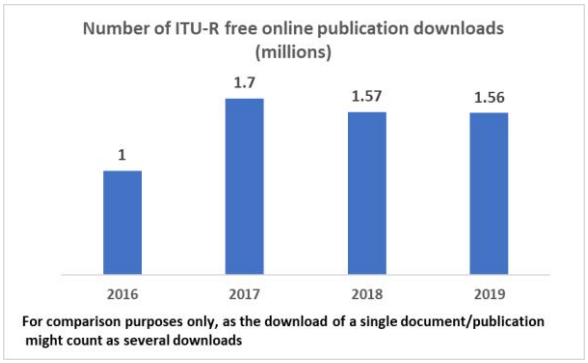
R.3-a: Increased knowledge and know-how on the Radio Regulations, Rules of Procedure, regional agreements, recommendations and best practices on spectrum use

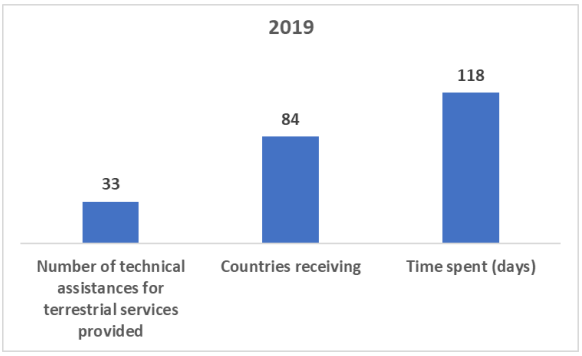
R.3-b: Increased participation in ITU-R activities (including through remote participation), in particular by developing countries

Progress achieved









ITU-T Objectives

Objective T.1: (Development of standards) Develop non-discriminatory international telecommunication/ICT standards (ITU-T recommendations), in a timely manner, and foster interoperability and improved performance of equipment, networks, services and applications

Outcomes

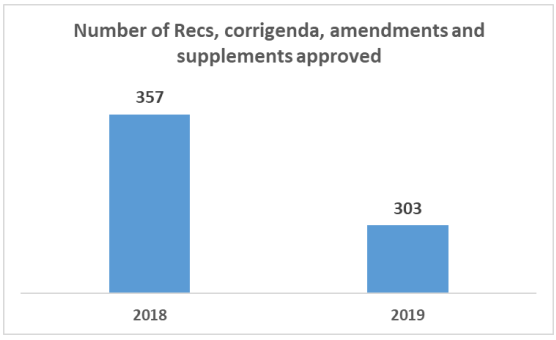
T.1-a: Increased utilization of ITU-T recommendations

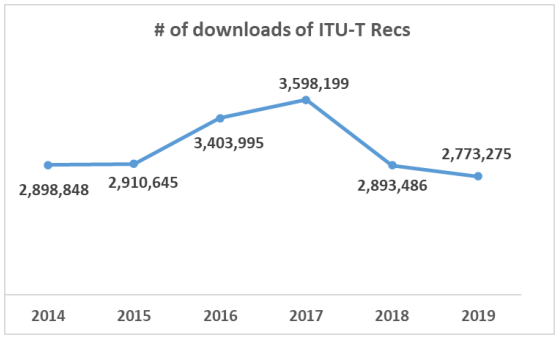
T.1-b: Improved conformance to ITU-T recommendations

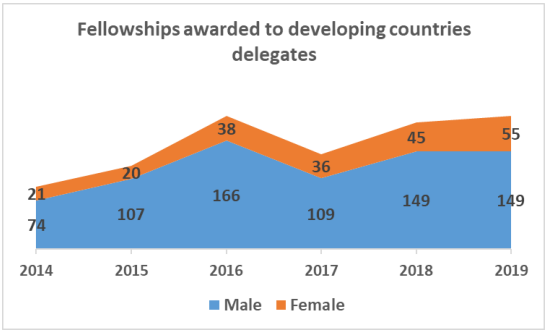
T.1-c: Enhanced standards in new technologies and services

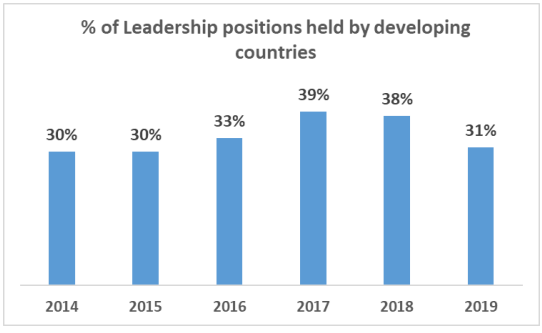
Progress achieved

T.1-a

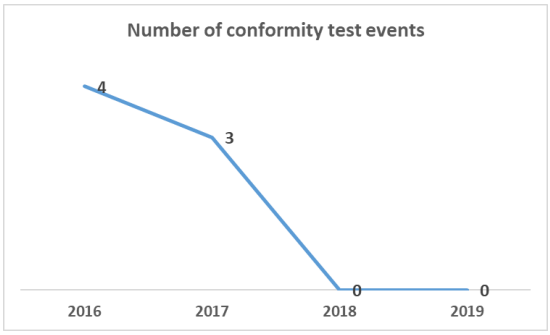


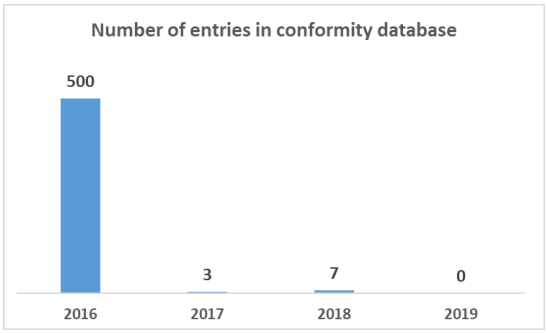




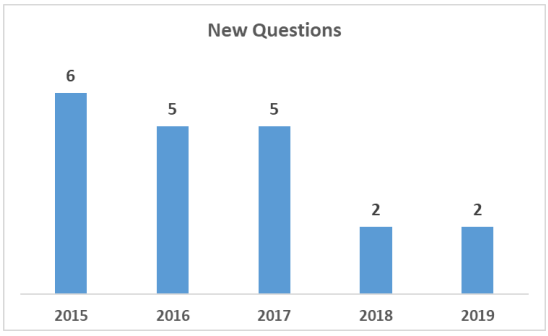


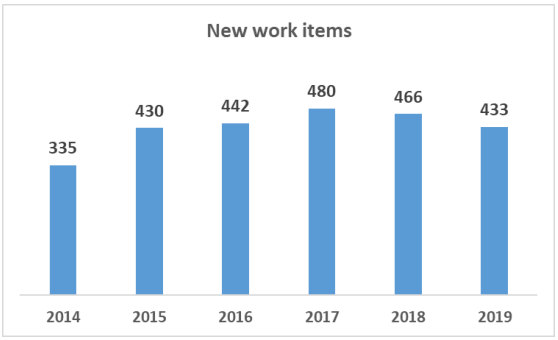
T.1-b





T.1-c





Objective T.2 (Bridging the standards gap): Promote the active participation of the membership, in particular developing countries, in the definition and adoption of non-discriminatory international telecommunication/ICT standards (ITU-T recommendations) with a view to bridging the standardization gap

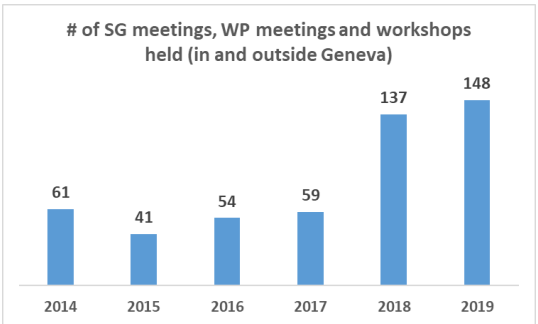
Outcomes

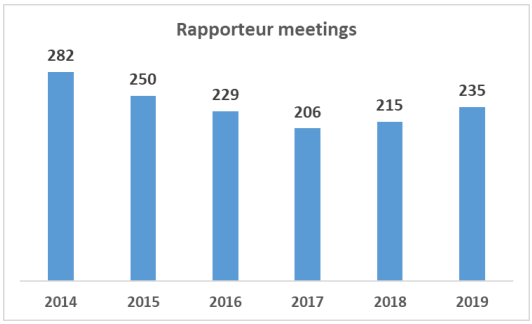
T.2-a: Increased participation in the ITU-T standardization process, including attendance of meetings, submission of contributions, taking leadership positions and hosting of meetings/workshops, especially from developing countries

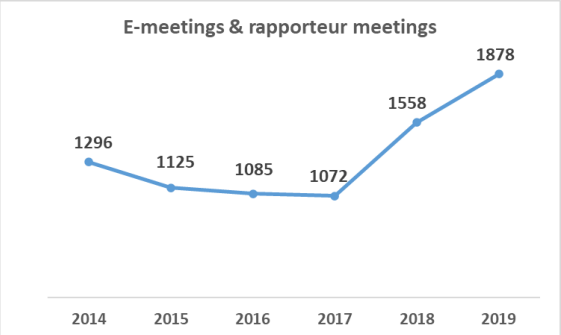
T.2-b: Increase of the ITU-T membership, including Sector Members, Associates and Academia

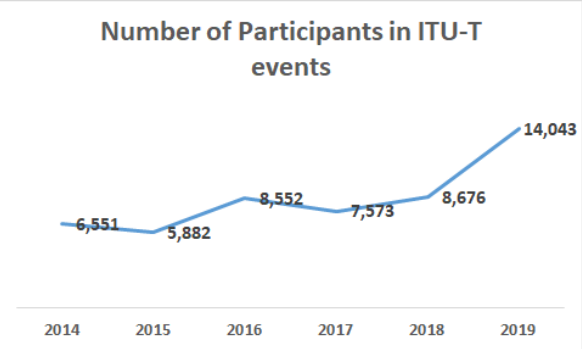
Progress achieved

T.2-a

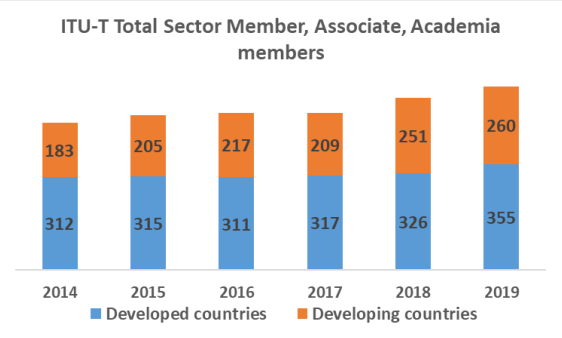








T.2-b

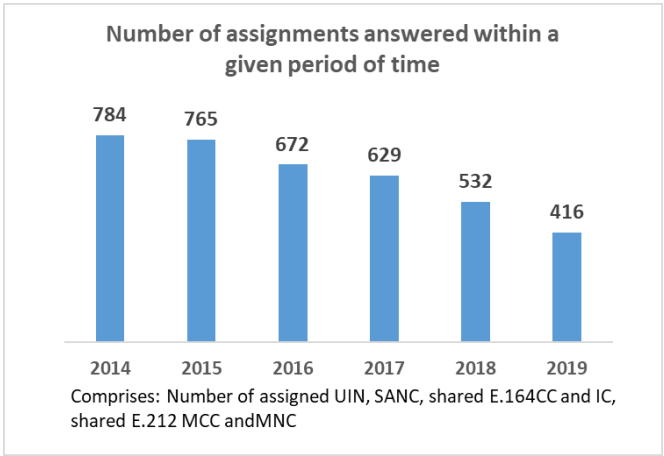


Objective T.3: (Telecommunication resources) Ensure effective allocation and management of international telecommunication numbering, naming, addressing and identification resources in accordance with ITU-T recommendations and procedures

Outcomes

T.3-a: Timely and accurate allocation of international telecommunication numbering, naming, addressing and identification resources, as specified in the relevant recommendations

Progress achieved



Objective T.4: (Knowledge sharing) Foster the acquisition, awareness, sharing of knowledge and know how on the standardization activities of ITU-T

Outcomes

T.4-a: Increased knowledge on ITU-T standards and on best practices in their implementation of ITU-T standards
T.4-b: Increased participation in ITU-T's standardization activities and increased awareness of the relevance of ITU-T standards
T.4-c: Increased Sector visibility

Progress achieved

Relevant indicators are already covered under T.1 and T.2 above

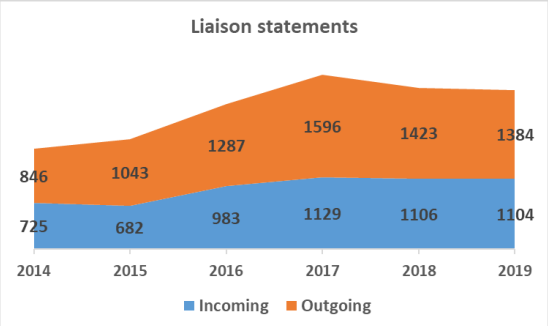
Objective T.5: (Cooperation with standardization bodies) Extend and facilitate cooperation with international, regional and national standardization bodies

Outcomes

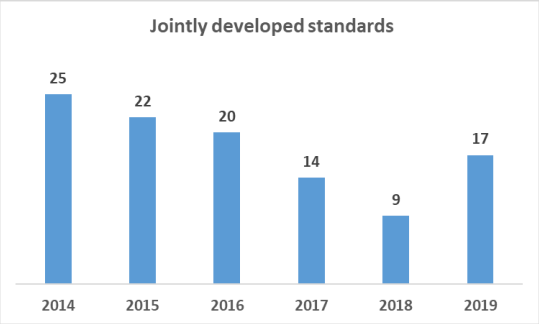
T.5-a: Increased communications with other standards organizations
T.5-b: Decreased number of conflicting standards
T.5-c: Increased number of memoranda of understanding/collaboration agreements with other organizations
T.5-d: Increased number of ITU-T A.4, A.5 and A.6 qualified organizations
T.5-e: Increased number of workshops/events organized jointly with other organizations

Progress achieved

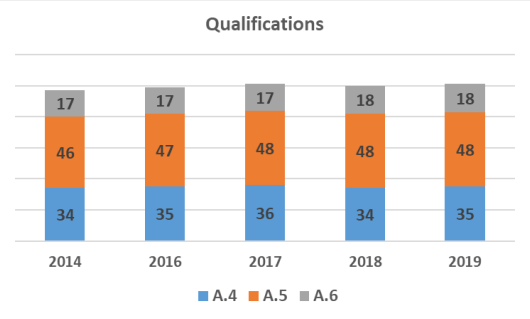
T.5-a



T.5-b/c



T1.5-d



ITU-D Objectives

Objective D.1: (Coordination) Foster international cooperation and agreement on telecommunication/ICT development issues

Outcomes

D.1-a: Enhanced review and increased level of agreement on the draft ITU-D contribution to the draft ITU strategic plan, the World Telecommunication Development Conference (WTDC) Declaration, and the WTDC Action Plan

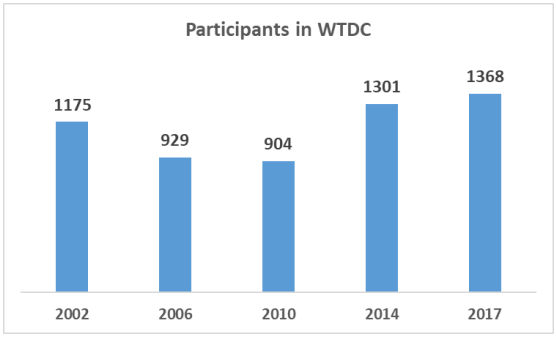
D.1-b: Assessment of the implementation of the Action Plan and of the WSIS Plan of Action

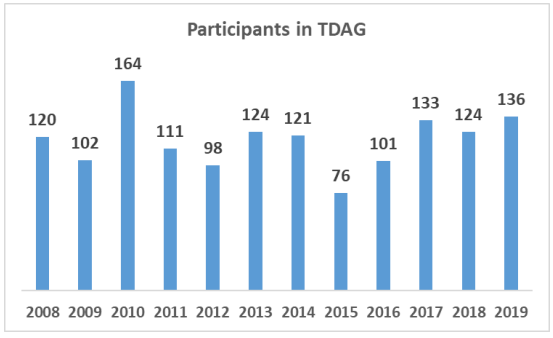
D.1-c: Enhanced knowledge-sharing, dialogue and partnership among the ITU membership on telecommunication/ICT issues

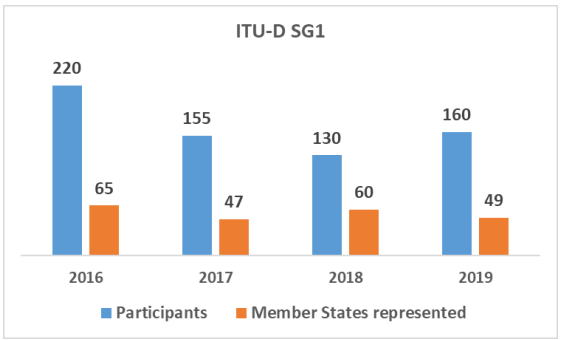
D.1-d: Enhanced process and implementation of telecommunication/ICT development projects and regional initiatives

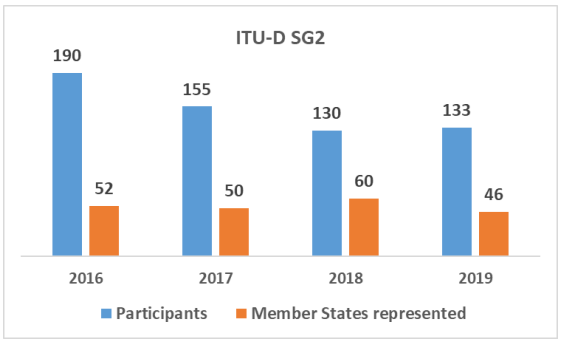
D.1.e: Facilitation of agreement to cooperate on telecommunication/ICT development programmes between Member States, and between Member States and other stakeholders in the ICT ecosystem, based on requests from ITU Member States involved

Progress achieved









Objective D.2: (Modern and secure telecommunication/ICT Infrastructure) Foster the development of infrastructure and services, including building confidence and security in the use of telecommunications/ICTs

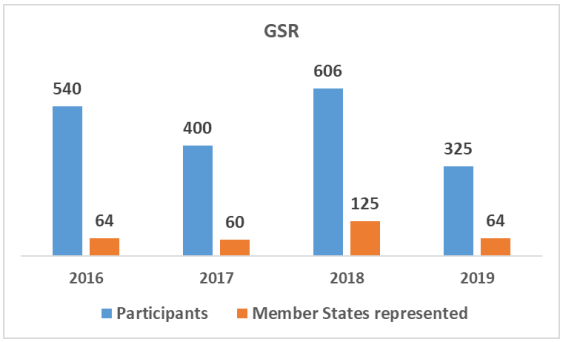
Outcomes

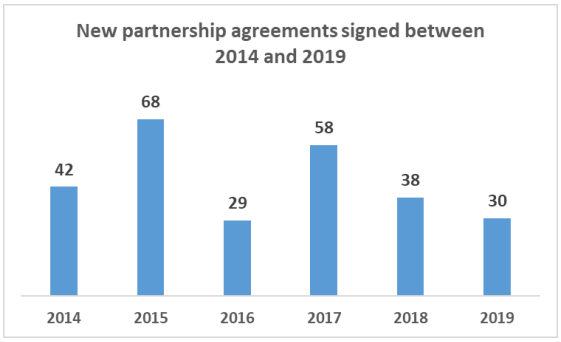
D.2-a: Enhanced capacity of the ITU membership to make available resilient telecommunication/ICT infrastructure and services.

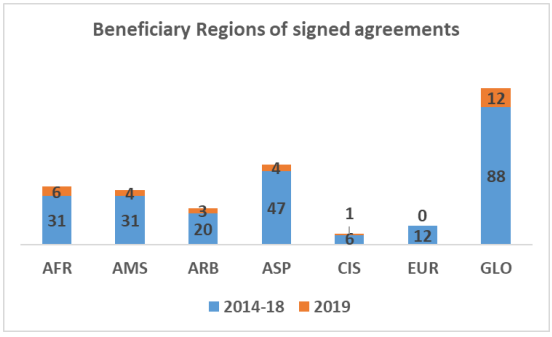
D.2-b: Strengthened capacity of Member States to effectively share information, find solutions, and respond to threats to cybersecurity, and to develop and implement national strategies and capabilities, including capacity building, encourage national, regional and international cooperation towards enhanced engagement among Member States and relevant players.

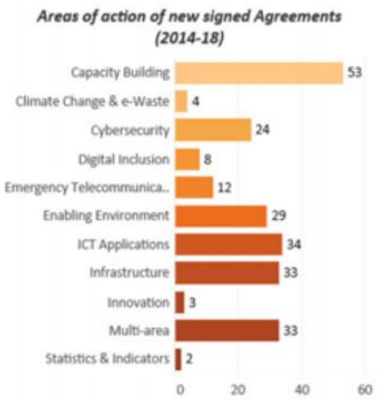
D.2-c: Strengthened capacity of Member States to use telecommunications/ICTs for disaster risk reduction and management, to ensure availability of emergency telecommunications, and support cooperation in this area.

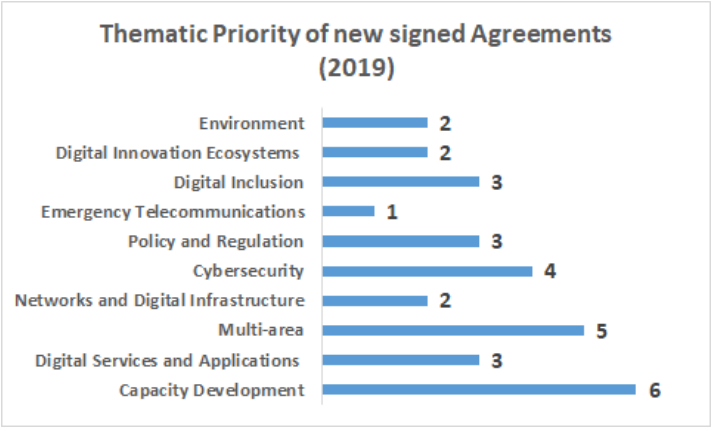
Progress achieved

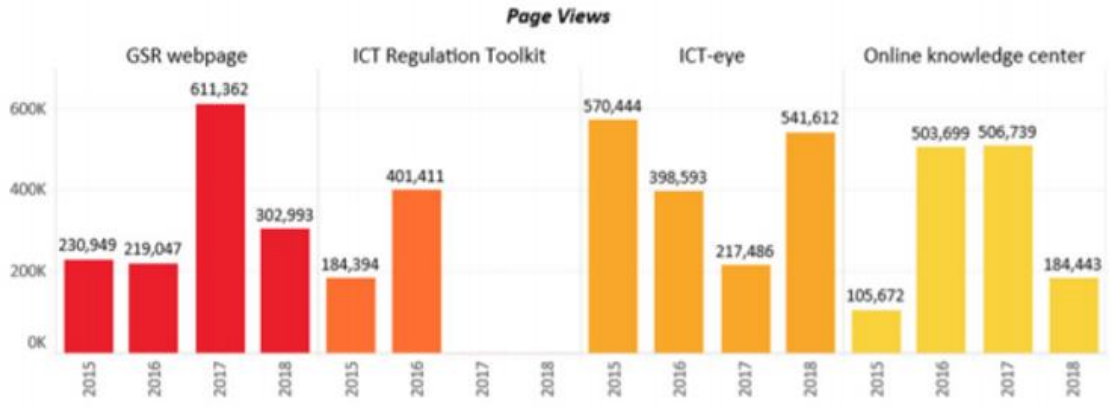












Objective D.3: (Enabling Environment) Foster an enabling policy and regulatory environment conducive to sustainable telecommunication/ICT development

Outcomes

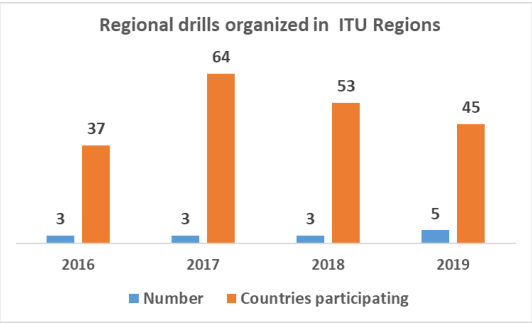
D.3-a: Strengthened capacity of Member States to enhance their policy, legal and regulatory frameworks conducive to development of telecommunications/ICTs.

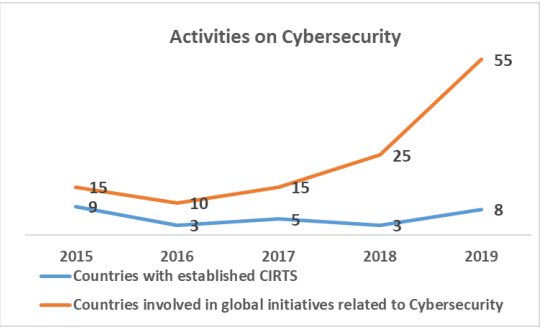
D.3-b: Strengthened capacity of Member States to produce high-quality, internationally comparable telecommunication/ICT statistics which reflect developments and trends in telecommunications/ICTs, based on agreed standards and methodologies.

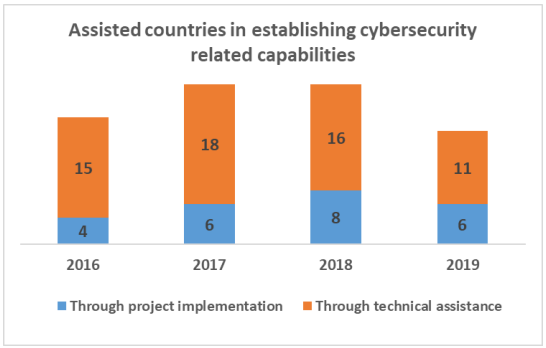
D.3-c: Improved human and institutional capacity of the ITU membership to tap into the full potential of telecommunications/ICTs.

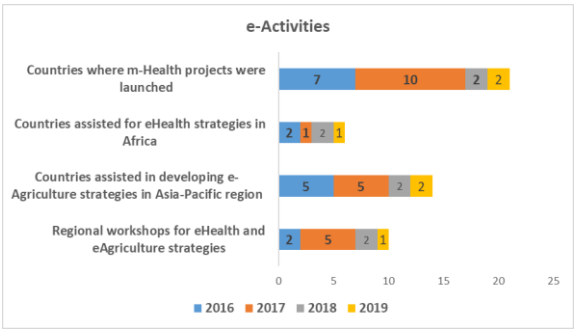
D.3-d: Strengthened capacity of the ITU membership to integrate telecommunication/ICT innovation and digitalization in national development agendas and to develop strategies to promote innovation initiatives, including through public, private, and public-private partnerships.

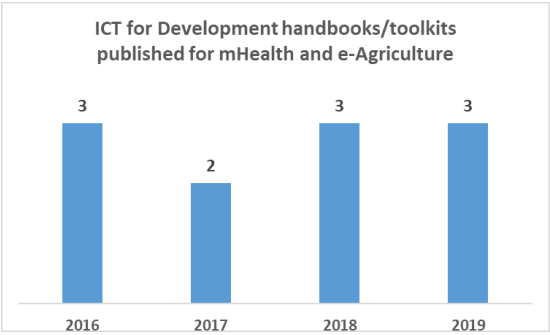
Progress achieved











Objective D.4: (Inclusive Information Society) Foster the development and use of telecommunications/ICTs and applications to empower people and societies for sustainable development

Outcomes

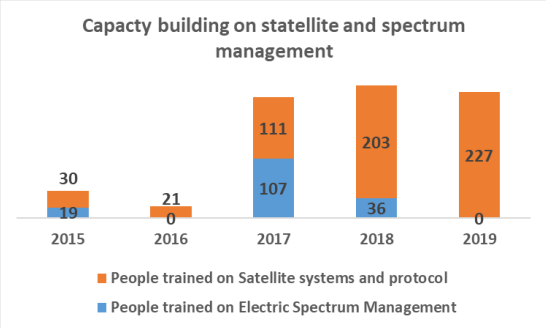
D-4-a: Improved access to and use of telecommunication/ICT in (LDCs, small island developing states (SIDS) and landlocked developing countries (LLDCs), and countries with economies in transition.

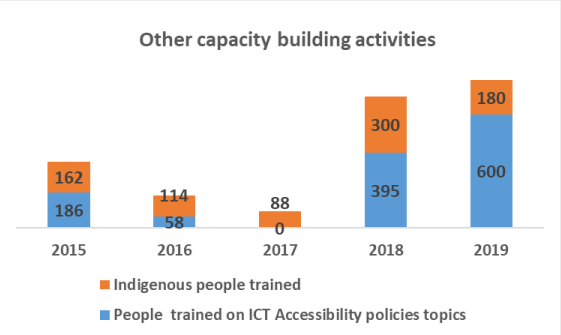
D.4-b: Improved capacity of the ITU membership to accelerate economic and social development by leveraging and using new technologies and telecommunication/ICT services and applications.

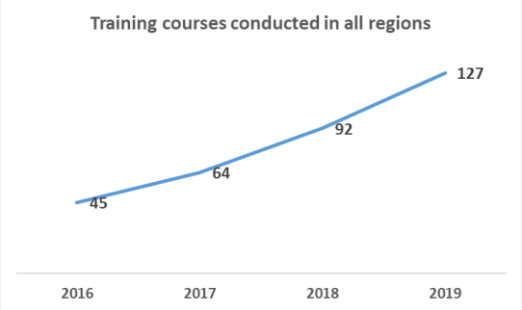
D.4-c: Strengthened capacity of the ITU membership to develop strategies, policies and practices for digital inclusion, in particular for the empowerment of women and girls, persons with disabilities and other persons with specific needs.

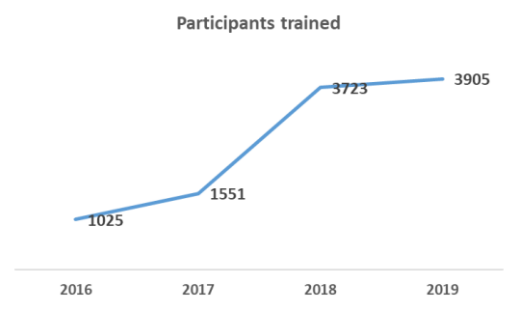
D.4-d: Enhanced capacity of the ITU membership to develop telecommunication/ICT strategies and solutions on climate-change adaptation and mitigation and the use of green/renewable energy.

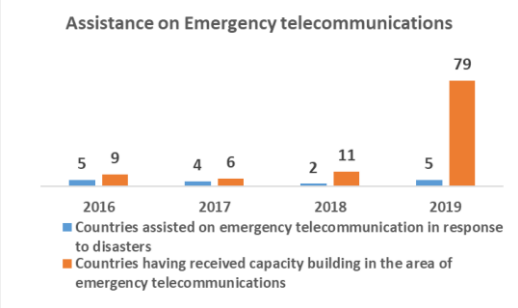
Progress achieved

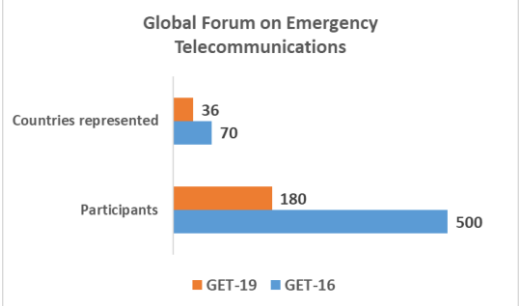


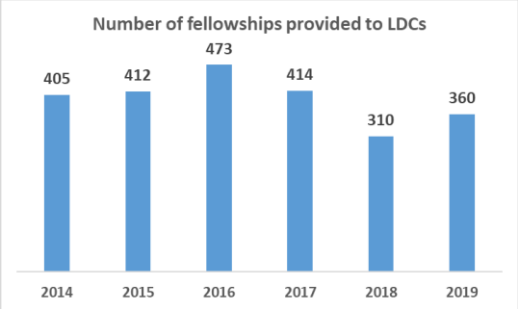


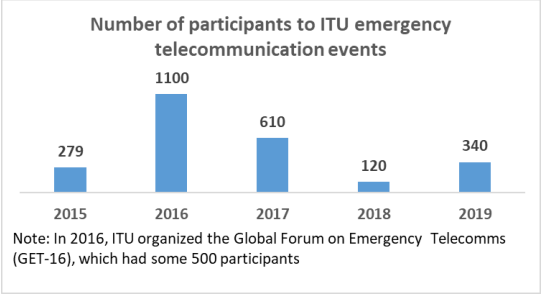












Inter-sectoral Objectives

Objective I.1: (Collaboration) Foster closer collaboration among all stakeholders in the telecommunication/ICT ecosystem

Outcomes

I.1-a: Increased collaboration among relevant stakeholders

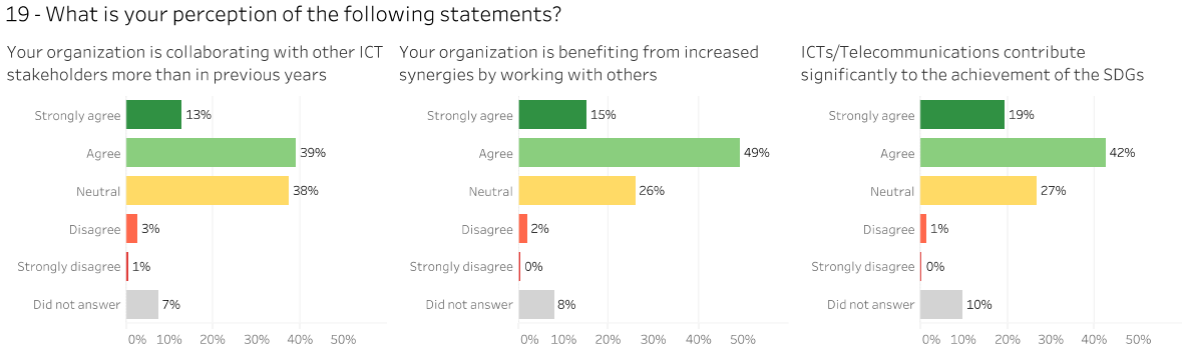
I.1-b: Increased synergies from partnerships on telecommunication/ICTs

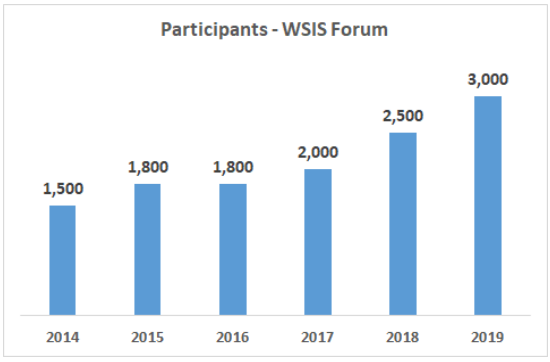
I.1-c: Increased recognition of telecommunications/ICTs as a cross-cutting enabler for implementing the WSIS Action Lines and the 2030 Agenda for Sustainable Development

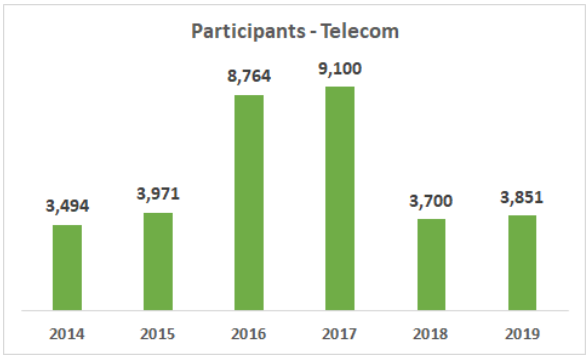
I.1-d: Enhanced support to ITU membership in developing and delivering ICT products and services

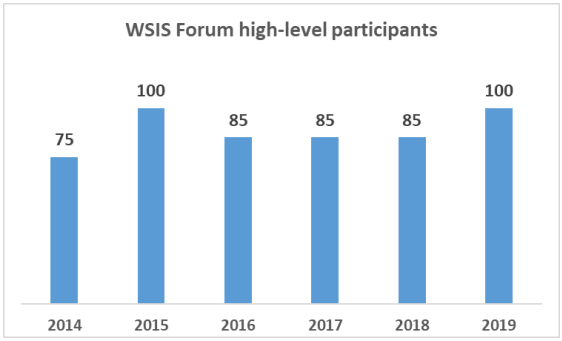
Progress achieved

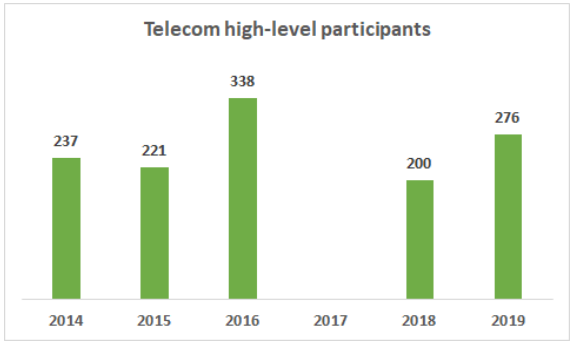
Three new Questions have been added at the ITU Membership survey 2020 to assess progress towards targets I.1-a, I.1-b and I.1-c.

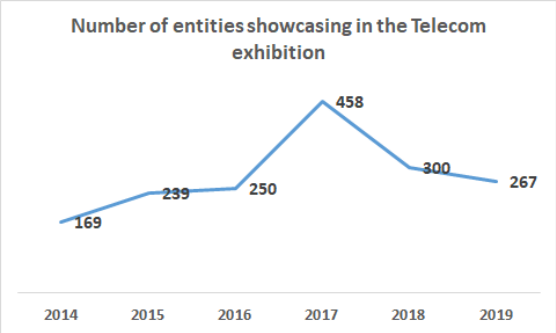


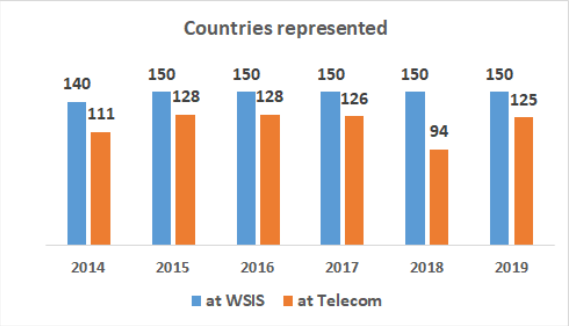










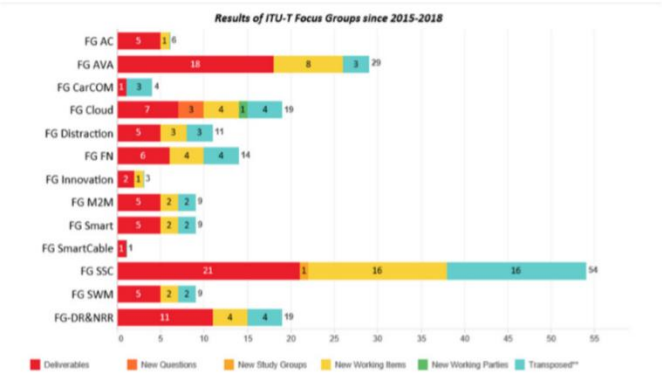


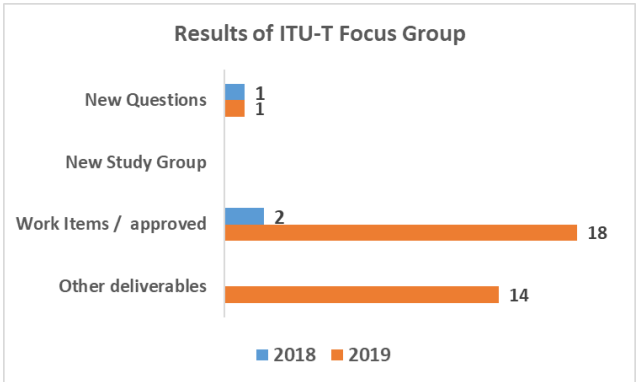
Objective I.2: (Emerging telecommunication/ICT trends) Enhance identification, awareness and analysis of digital transformation and emerging trends in the telecommunication/ICT environment

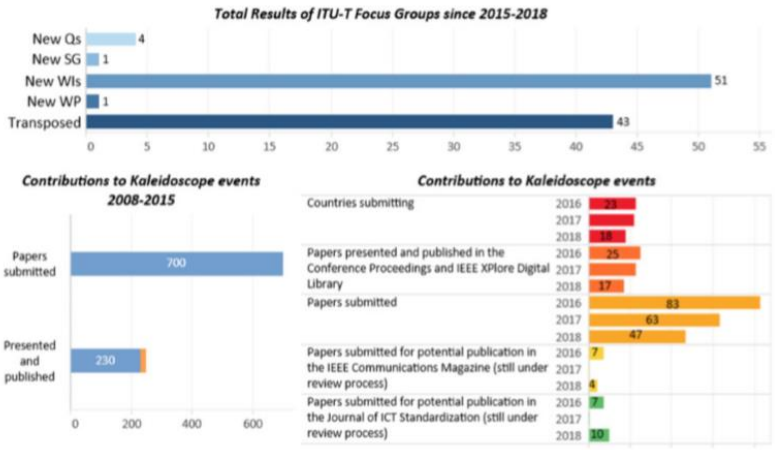
Outcomes

I.2-a: Identification, awareness and analysis of digital transformation and emerging trends in telecommunications/ICTs

Progress achieved







Focus Group (2019)	New Questions	New Study Group	Work Items / approved	other deliverables
FG-AI4AD				
FG-QIT4N				
FG-AI4EE				
FG-AI4H				
FG-VM			1 approved	
FG NET-2030			1 ongoing	2
FG-ML5G			1 ongoing + 2 approved (Y.3172 and Y.Suppl 55)	1
FG DLT	a new Question established (Q22/16)		7 (Q22/16),	2 technical papers (Q22/16),
FG DFC				
(FG-DPM)			2 WIs in SG20	
(FG DFS)			SG3 agreed to publish nine FG-DFS deliverables as SG3 Technical Reports	
FG-DR&NRR			2 (approved in 2019, E.102 and E.Suppl.1 to ITU-T E.100 series)	

Objective I.3: (Telecommunication/ICT accessibility) Enhance telecommunications/ICTs accessibility for persons with disabilities and specific needs

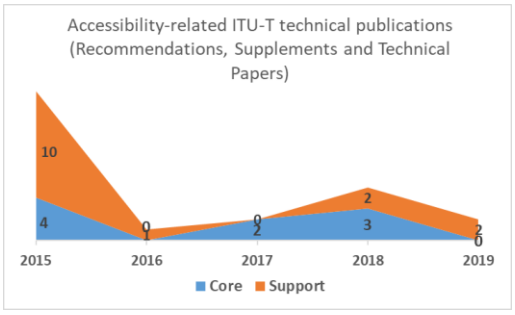
Outcomes

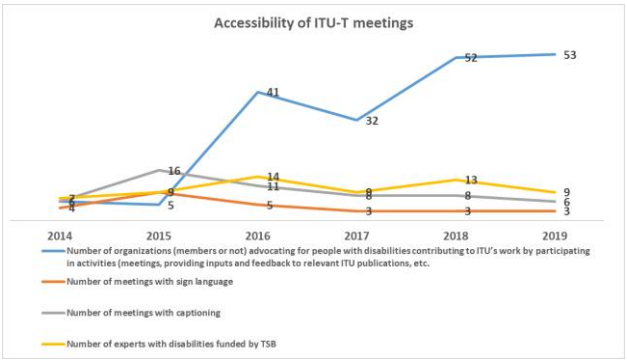
I.3-a: Increased availability and compliance of telecommunication/ICT equipment, services and applications with universal design principles

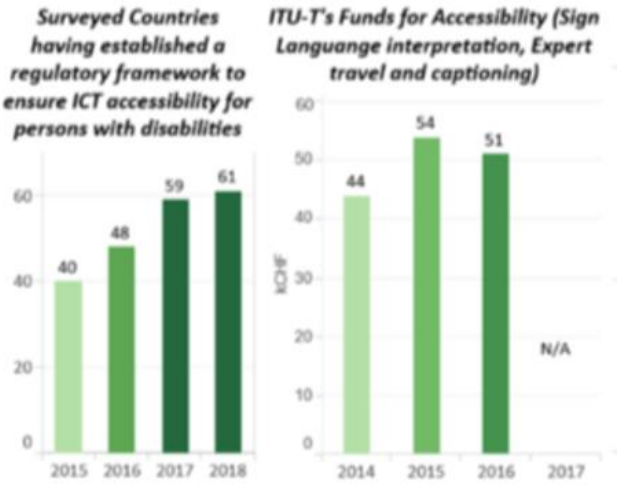
I.3-b: Increased engagement of organizations of persons with disabilities and specific needs in the work of the Union

I.3-c: Increased awareness, including multilateral and intergovernmental recognition, of the need to enhance access to telecommunications/ICTs for persons with disabilities and specific needs

Progress achieved







Objective I.4: (Gender equality and inclusion) Enhance the use of telecommunication/ICTs for gender equality and inclusion, and empowerment of women and girls

Outcomes

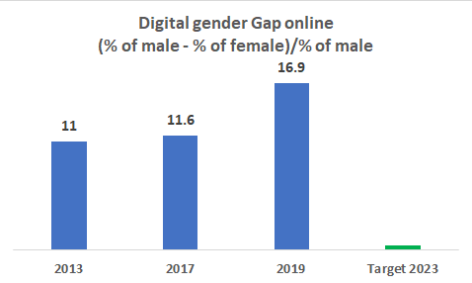
I I.4-a: Enhanced access to and use of telecommunication/ICTs to promote the empowerment of women

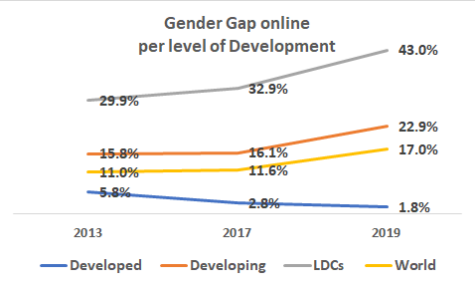
I.4-b: Enhanced participation of women at all level of decision making in the work of the Union and the telecommunication/ICT sector

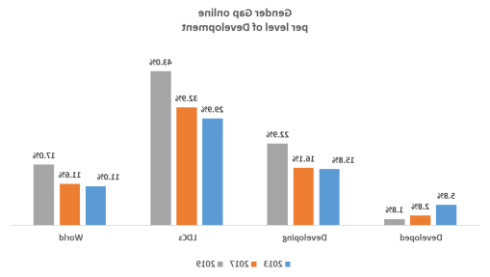
I.4-c: Increased engagement with other UN organizations and stakeholders involved in using telecommunication/ICTs to promote the empowerment of women

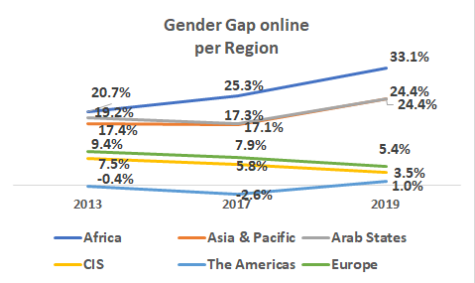
I.4-d: Full implementation of UN system-wide strategy on gender parity within ITU's remit

Progress achieved









Objective I.5: (Environmental sustainability) Leverage telecommunication/ICTs to reduce environmental footprint

Outcomes

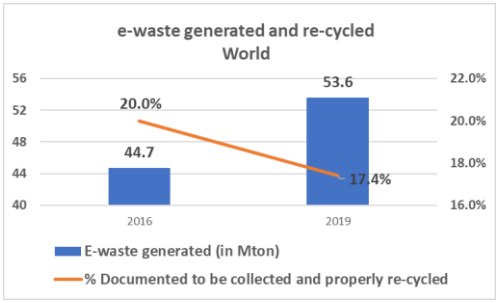
I.5-a: Improved efficiency of environmental policies and standards

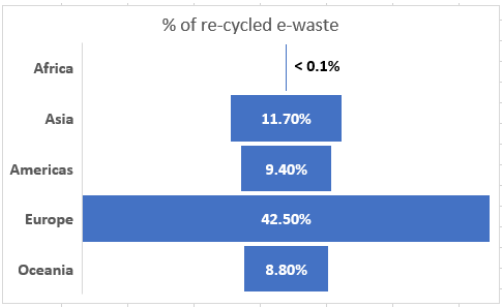
I.5-b: Reduced energy consumption from telecommunication/ICT applications

I.5-c: Increasing number of recycled e-waste

I.5-d: Improved solutions for Smart Sustainable Cities

Progress achieved





Objective I.6: (Reducing overlap and duplication) Reduce the areas of overlap and duplication and foster closer and more transparent coordination among General Secretariat and ITU Sectors, taking into account the Union's budgetary provisions and the expertise and mandate of each Sector

Outcomes

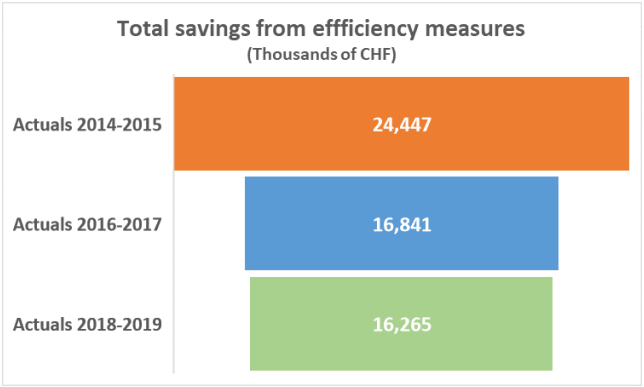
I.6-a: Closer and more transparent collaboration among the ITU Sectors, the General Secretariat and the 3 Bureaux

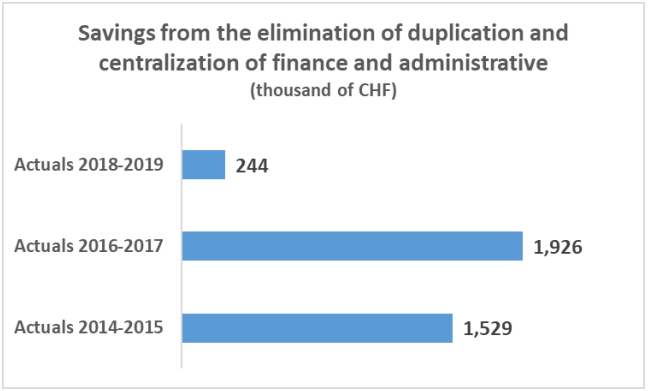
I.6-b: Reducing the areas of overlap and duplication among the ITU Sectors and the work of the General Secretariat and the 3 Bureaux

I.6-c: Realize savings through avoidance of areas of overlap

Progress achieved

[Note: This is a new objective. Indicators are under development. Proxy data can be taken from section 3.3.1 below (savings from efficiency measures).

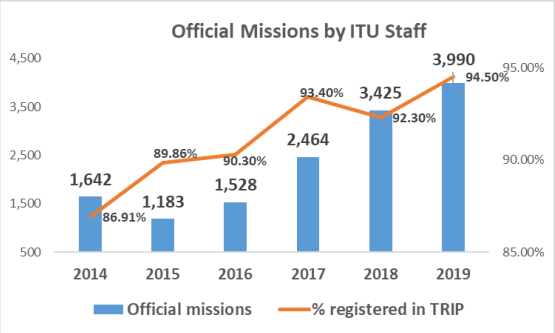


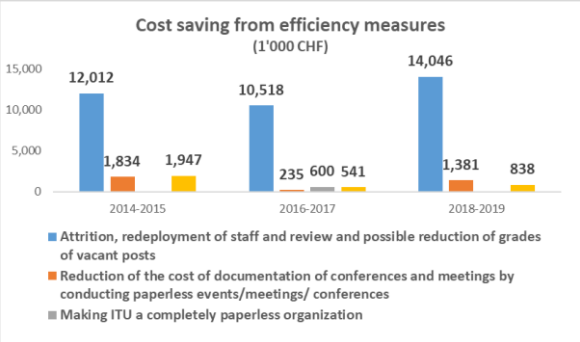

Savings from the elimination of duplication and centralization of finance and administrative
(thousand of CHF)
Actuals 2018-2019
244
Actuals 2016-2017
1,926
Actuals 2014-2015
1,529

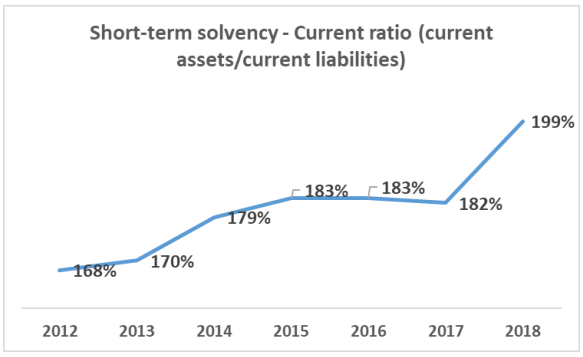
Enablers

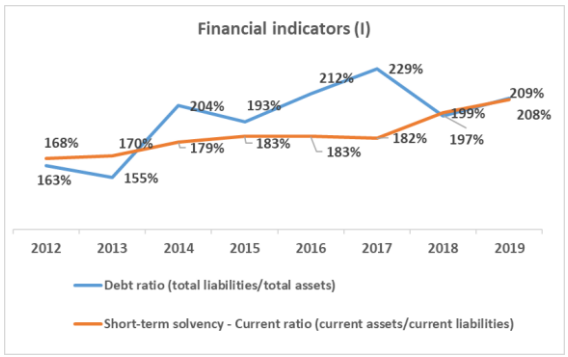
E.1 Ensure efficient and effective use of human, financial and capital resources, as well as a work-conducive, safe and secure working environment

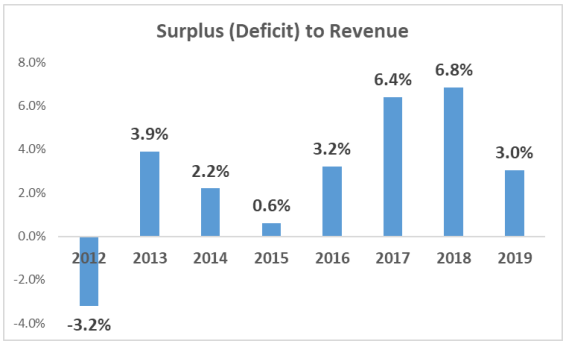
	2014	2015	2016	2017	2018	2019
IPSAS Compliance (or Annual Audit of accounts is unqualified)	✓	✓	✓	✓	✓	✗
Procurement and Travel Services guidelines (ITU guidelines and UN good practices in place)	✓	✓	✓	✓	✓	✓
Budget implementation (not overspent)	✓	✓	✓	✓	✓	✓
Work related injuries or incidents < 2%	✓	✓	✓	✓	✓	✓

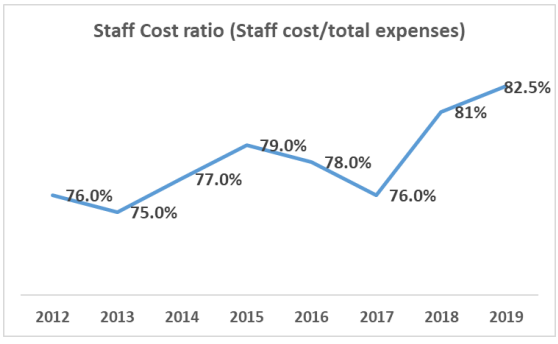


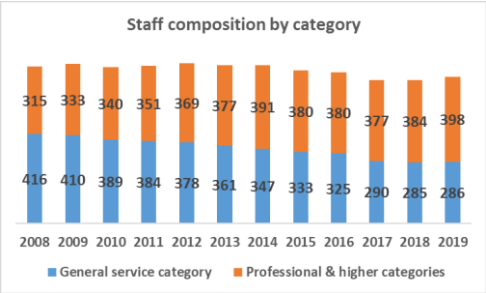


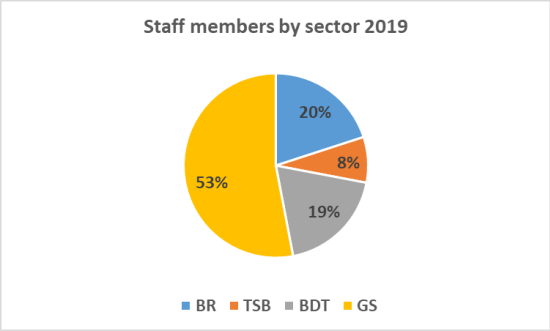


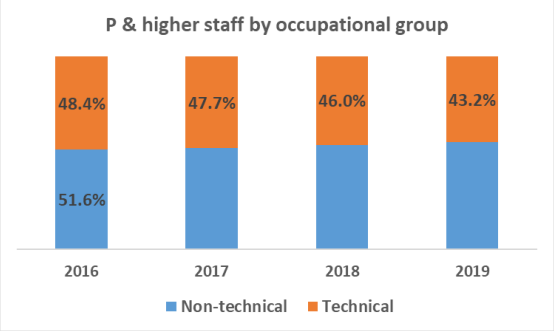


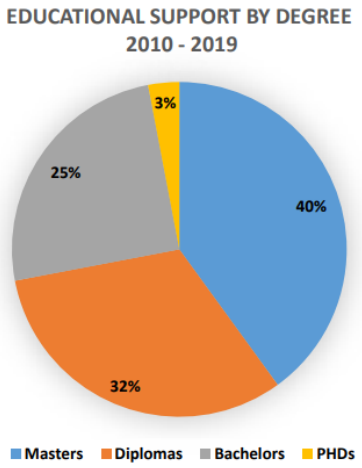




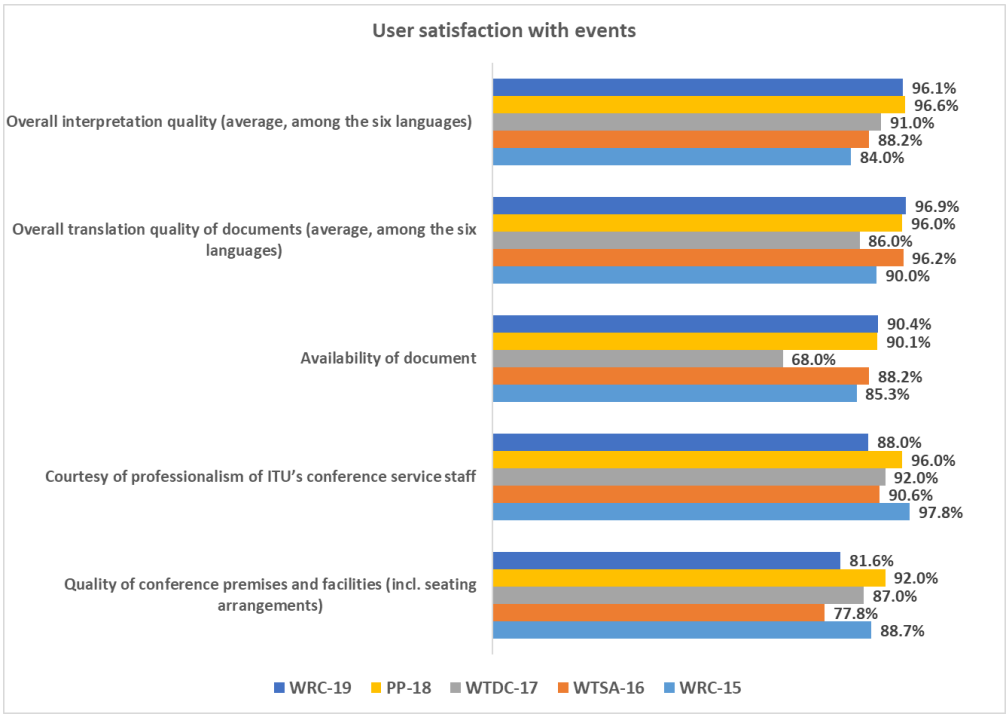

Staff composition by category
315 333 340 351 369 377 391 380 380 377 384 398
416 410 389 384 378 361 347 333 325 290 285 286
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
General service category
Professional & higher categories

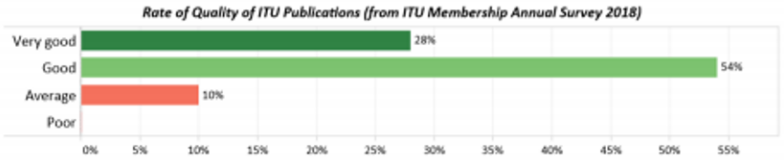

Staff members by sector 2019
20%
8%
19%
53%
BR
TSB
BDT
GS

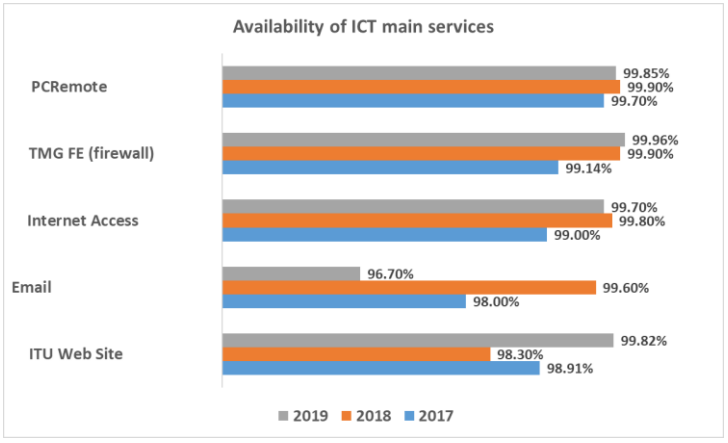

P & higher staff by occupational group
48.4%
47.7%
46.0%
43.2%
51.6%
2016
2017
2018
2019
Non-technical
Technical

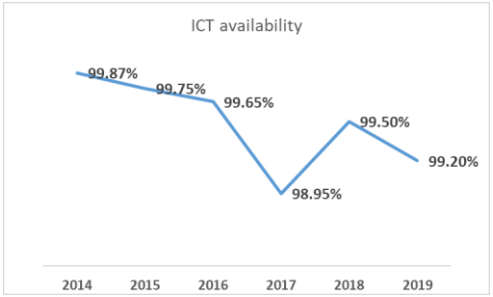

EDUCATIONAL SUPPORT BY DEGREE
2010 - 2019
3%
25%
40%
32%
Masters
Diplomas
Bachelors
PHDs

E.2 Ensure efficient and accessible conferences, meetings, documentation, publications and information infrastructures









E.3 Ensure efficient membership-related, protocol, communication and resource mobilization services

908 Member Entities
1,233 Memberships

Membership Annual Report 2019

Membership data as of 31st December 2019

110 Members of all 3 Sectors

	ITU-R	ITU-T	ITU-D	Academia*	Grand Total
Sector Members	272	268	307		
Associates	22	184	17		
Academia*				163	
Contribution Amount	CHF 6,716,425	CHF 8,449,525	CHF 1,558,200	CHF 423,338	CHF 17,147,488

* **Note**: Academia are automatically members of all 3 sectors

Key Membership Performance Indicators (vs. 2018)

Member Entities	↑	Members of 3 Sectors	↑
Overall Memberships	↑	Overall Estimated Contributions	↑
Sector Members	↑	ITU-R Members	↑
Associates	↑	ITU-T Members	↑
Academia	↑	ITU-D Members	↑

Net Membership by Sector/Type

Sector	Membership type	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ITU-R	Sector member	264	248	255	255	258	259	270	267	265	263	272
	Associate	13	17	18	16	16	15	18	19	21	21	22
ITU-T	Sector member	290	261	263	267	274	272	266	253	257	257	268
	Associate	101	111	119	128	130	132	132	128	137	157	184
ITU-D	Sector member	314	309	320	329	344	336	337	323	314	306	307
	Associate		5	6	7	9	10	11	11	12	14	17
Academia*	Academia*			23	40	58	73	95	107	124	153	163

Explanation
- Blank cells represent a year with no movement at all
- Beige cells represent a net movement of zero (ie. New = (Denounced + Excluded)
- Green cells represent positive net movement within the year (ie. New Members > Denounced + Excluded)
- Red cells represent negative net movement within the year (ie. New Members < Denounced + Excluded)
- Darker colours represent greater numbers

Membership Yearly Performance 2019

	Membership Changes 2019			Net Change 2019
	New	Denounced	Excluded	
Number of Memberships	112	37	13	62
Contribution Amount	CHF 1,469,425	CHF 622,750	CHF 119,250	CHF 727,425

Yearly Membership growth

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Memberships	1,014	1,006	985	951	1,004	1,042	1,089	1,097	1,129	1,108	1,130	1,171	1,233
% change	-3.61%	-0.79%	-2.09%	-3.45%	5.57%	3.78%	4.51%	0.73%	2.92%	-1.86%	1.99%	3.63%	5.29%
Contribution amount	18,512,900	18,033,250	17,088,525	16,306,775	15,964,263	16,301,475	16,571,113	16,575,088	16,779,138	16,101,400	16,257,750	16,420,063	17,147,488
% change in contribution	-5.98%	-2.59%	-5.24%	-4.57%	-2.10%	2.11%	1.65%	0.02%	1.23%	-4.04%	0.97%	1.00%	4.43%

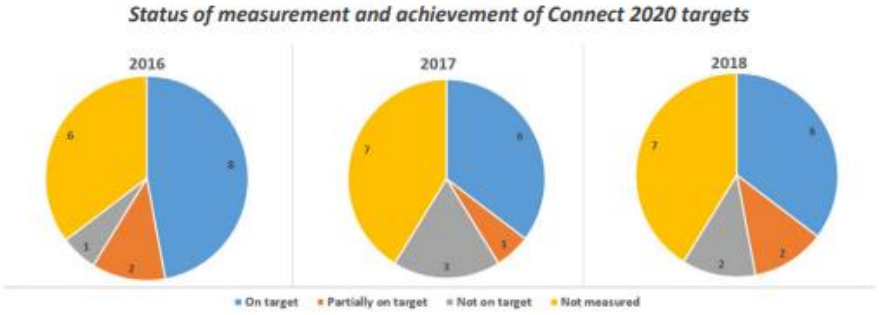
Net Membership by Sector/Type

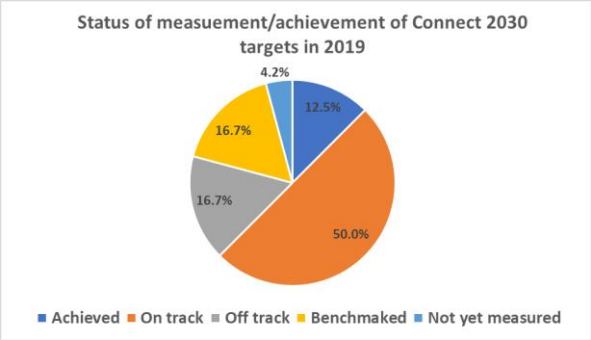
Sector	Membership type	December 2018	January 2019	February 2019	March 2019	April 2019	May 2019	June 2019	July 2019	August 2019	September 2019	October 2019	November 2019	December 2019
ITU-R	Sector member	263	262	265	265	267		269			269	272	274	272
	Associate							22						
ITU-T	Sector member	257	261	262	263	265	266	265	264	265	264	266	266	268
	Associate	157	163	166	167	174	175	175	176	178	179		181	184
ITU-D	Sector member	306	303	303	304	305		304	304		303	305	305	307
	Associate				16			16	17					17
Academia*	Academia*		151	156		157	159	158		159	160	163	163	163

Explanation
- Blank cells represent a year with no movement at all
- Beige cells represent a net movement of zero (ie. New = (Denounced + Excluded)
- Green cells represent positive net movement within the year (ie. New Members > Denounced + Excluded)
- Red cells represent negative net movement within the year (ie. New Members < Denounced + Excluded)
- The dark red in June represents the Exclusions as per Resolution 152.

Net Movement: -4 … 7

E.4 Ensure efficient planning, coordination and execution of the strategic plan and operational plans of the Union





E.5 Ensure effective and efficient governance of the organization (internal and external)