

**INTERNATIONAL
TELECOMMUNICATION
UNION**

ITU Contribution to the Implementation of the WSIS Outcomes

2025

DRAFT

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**International Telecommunication Union (ITU),
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I. Introduction

1. The coordination and implementation of the outcomes of the World Summit on the Information Society (WSIS) continue to be among the priorities of the Secretary-General of the International Telecommunication Union (ITU). The vision of the Union, as defined in the ITU Strategic Plans for 2024-2027, is “an information society, empowered by the interconnected world, where telecommunication/information and communication technologies enable and accelerate social, economic and environmentally sustainable growth and development for everyone”. This aligns with the [WSIS Outcome Documents](#). The strategic goals of ITU — Universal Connectivity and Sustainable Digital Transformation — are central to ITU’s mission of facilitating progress towards the implementation of the WSIS Action Lines and the 2030 Agenda for Sustainable Development. These goals aim to ensure that all people, everywhere, have access to affordable, high-quality, and secure information and communication technologies (ICTs), and that the transformative power of digital technologies is harnessed to drive inclusive, equitable development.
2. Two significant events in 2015 directly shaped the strategic and operational efforts to implement the WSIS outcomes:
 - The **United Nations General Assembly (UNGA) Sustainable Development Summit**, 25 - 27 September 2015, where [Resolution A/70/1 "Transforming our world: the 2030 Agenda for Sustainable Development"](#), "was adopted.
 - The **UNGA High-level Meeting on the overall review of the implementation of the outcomes of the World Summit on the Information Society**, 14-16 December 2015, which resulted in the adoption of [Resolution A/70/125 "Outcome document of the high-level meeting of the General Assembly on the overall review of the implementation of the outcomes of the WSIS"](#).
3. The ITU Plenipotentiary Conference 2022 (PP-22), held in Bucharest from 26 September to 14 October 2022, approved key resolutions that continue to shape ITU’s role in implementing the outcomes of WSIS and advancing the UN’s 2030 Agenda for Sustainable Development. Notably, the revision of [ITU PP Resolution 140](#) emphasized ITU’s commitment to fostering digital cooperation and furthering the implementation of WSIS outcomes in alignment with the SDGs.
 - Revised Resolution 140 highlights the continued need to improve global digital cooperation, echoing the pledge in UN General Assembly Resolution 75/1 to "improve digital cooperation." It also aligns with ongoing UN resolutions on



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- ICTs for sustainable development and progress reviews by the UN Economic and Social Commission (ECOSOC).
- Over the nearly two decades since the WSIS outcomes were established, ICTs have dramatically reshaped global connectivity. Resolution 140 underscores that ongoing investment in digital infrastructure is vital for advancing connectivity, narrowing the digital divide, and ensuring access for vulnerable groups, including those in rural and underserved areas.
 - Resolution 140 also affirms that the success of the 2030 Agenda for Sustainable Development hinges on expanding ICT access and connecting the unconnected. The WSIS Forum will remain a key platform for monitoring progress and reviewing implementation towards achieving these goals.
 - ITU's Member States expressed strong support for advancing the WSIS Action Lines, which are integral to achieving the SDGs. The PP-22 endorsed updates to Resolution 140, reinforcing the need to increase ICT access and close the digital divide, ensuring that all populations, particularly the vulnerable, benefit from ICT-enabled development.
 - As part of the WSIS+20 Review Process, ITU will continue its collaboration with relevant UN agencies to support the review of WSIS outcomes at the UNGA 2025. ITU is committed to playing an active role in this process in accordance with its WSIS+20 Roadmap.
4. During the PP-22 in Bucharest, Romania, H.E. Mr António Guterres, the Secretary-General of the United Nations, reiterated “the importance of supporting the World Summit on the Information Society” and highlighted that “the International Telecommunication Union has a vital role to play in accelerating global connectivity for all by 2030”.
 5. The Kigali Declaration from the World Telecommunication Development Conference (WTDC-22) and previous ITU Plenipotentiaries have continued to advocate for expanding digital infrastructure and ensuring that digital transformation benefits all people, reinforcing ITU’s ongoing commitment to a connected and inclusive world.
 6. As WSIS marks its 20-year milestone in 2025, the UNGA continues to emphasize the vital role of ICTs in achieving the SDGs. The guidance provided in Resolution A/70/125—adopted during the ten-year review of WSIS—remains a key reference, calling for enhanced alignment between the WSIS process and the 2030 Agenda. The resolution highlights the cross-cutting nature of ICTs in accelerating progress across all 17 SDGs and encourages all stakeholders to integrate ICTs into their development strategies. As the global WSIS+20 review takes shape in 2025, this alignment becomes even more critical, reaffirming ICTs as powerful enablers of inclusive and sustainable development.
 7. Within the ITU, the implementation and follow-up of WSIS outcomes are undertaken across all three Sectors (Standardization, Radiocommunication and the Development Sector) and the General Secretariat. These activities are documented annually in the report titled “ITU’s Contribution to the Implementation of the WSIS Outcomes.” The 2025 edition of this report reflects ITU’s ongoing commitment to supporting WSIS implementation, particularly in light of the WSIS+20 Review and the forthcoming UNGA review process. The report showcases ITU’s multifaceted

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contributions, including operational and policy-level efforts that demonstrate the strong link between the WSIS Action Lines and the SDGs. Key roles undertaken by ITU in the WSIS framework include:

- Lead facilitator (along with UNESCO and UNDP) in coordinating the multistakeholder implementation of the Geneva Plan of Action.
 - Facilitator of Action Lines C2 (Information and communication infrastructure), C4 (Capacity Building), C5 (Building confidence and security in the use of ICTs); and Action Line C6 (Enabling environment).
 - Co-facilitator/partner in Action Lines C1, C3, C7, C8, C9 and C11;
 - Rotating Chair of the United Nations Group on Information Society (UNGIS);
 - Steering committee member of the Partnership on Measuring ICT for Development;
 - Facilitator of the WSIS Stocktaking Process;
 - Initiator and facilitator of the WSIS Project Prize;
 - Implementer of other WSIS outcomes.
8. To ensure strategic coherence and institutional alignment, the WSIS&SDG Task Force, chaired by the ITU Deputy Secretary-General, continues to oversee ITU's internal coordination on WSIS and SDG-related initiatives. In line with ITU Council Resolution 1332, the terms of reference for the Task Force were revised to incorporate enhanced coordination on SDG implementation, including support for the WSIS+20 Roadmap and the UNGA 2025 review process.
9. This document is structured into eight sections. Following the introduction, Section 2 outlines the alignment between the WSIS Action Lines and the 2030 Agenda for Sustainable Development. Section 3 provides an overview of ITU's activities and projects carried out in 2021 in the context of implementing the WSIS outcomes, while Section 4 highlights ITU's role in the Overall Review of the Implementation of the WSIS Outcomes. Section 5 presents key forums, innovative initiatives, and planned future activities aimed at supporting the full implementation of the WSIS outcomes. Section 6 focuses on the WSIS+20 Review and WSIS beyond 2025, and Section 7 addresses the Global Digital Compact. Section 8 concludes the report with conclusions and forward-looking considerations.

II. WSIS Action Lines and the 2030 Agenda for Sustainable Development



10. In line with UNGA Resolutions A/70/1 and A/70/125, the implementation of the WSIS Process has been aligned with the 2030 Agenda for Sustainable Development, highlighting the direct linkages between the WSIS Action Lines and the SDGs.

a) High Level Political Forum (HLPF) 2025

11. The High-Level Political Forum (HLPF) 2025, convened by the United Nations Economic and Social Council (ECOSOC) from 14 to 23 July 2025 in New York, focused on *“Advancing sustainable, inclusive, science- and evidence-based solutions for the 2030 Agenda and its SDGs for leaving no one behind.”* The forum conducted in-depth reviews of SDGs 3, 5, 8, 14, and 17, emphasizing the critical role of digital technologies in achieving these goals. ITU contributed to the discussions through its Council contribution, alongside submissions from the Broadband Commission, WSIS, UNGIS, and the Partnership on Measuring ICT for Development. ITU actively participated in HLPF 2025 through these submissions, expert group meetings, and various side events focused on digital cooperation and infrastructure development.

b) WSIS Action Lines and SDG Matrix

12. Since its introduction at the WSIS Forum 2015, the [WSIS Action Lines and SDG Matrix](#)—developed by United Nations agencies and coordinated by ITU—has served as a vital tool to map how ICTs contribute to achieving the SDGs. This Matrix remains a key reference for stakeholders shaping the future of the WSIS process and advancing the 2030 Agenda for Sustainable Development.
13. A key objective of the WSIS process is to harness the potential of ICTs to support sustainable development and improve quality of life, in line with its vision of building a people-centered, inclusive, and development-oriented Information Society. The WSIS-SDG Matrix was developed to strengthen this connection by aligning the WSIS Action Lines with the 2030 Agenda for Sustainable Development, ensuring that

efforts to expand ICT access and capabilities contribute directly to the achievement of the Sustainable Development Goals.

14. Each WSIS Action Line is led by one or more UN-WSIS Action Line Facilitators, who are responsible for coordinating implementation, monitoring progress, and promoting collaboration among stakeholders. These facilitators play a central role in ensuring that the Action Lines remain responsive to emerging challenges and aligned with global development priorities. As part of their mandate, facilitators organize dedicated sessions during the annual WSIS Forum to share updates, best practices, and insights from the ground, contributing to the continuous evolution and relevance of the WSIS-SDG Matrix.
15. The WSIS Action Lines facilitators have prepared presentations on the WSIS+20 Review Action Lines highlighting the milestones, challenges and emerging trends beyond 2025. Please see [here](#).

III. Overview of ITU activities and projects undertaken since 2023 in the context of the implementation of WSIS outcomes, also related to the 2030 agenda for sustainable development.

a) Lead facilitator (along with UNESCO and UNDP) in organizing the multistakeholder implementation of the Geneva Plan of Action.

16. Since 2006, ITU (along with UNESCO and UNDP) has played a leading facilitating role in the implementation of the Geneva Plan of Action (para 109 of the Tunis Agenda). In 2015, the UNGA resolution A/70/125 recognized the WSIS Forum as a platform for discussion and sharing of best practices in the implementation of the World Summit outcomes by all stakeholders, and stated that it should continue to be held annually.
17. At the regional level, the UN Regional Commissions have played a key role in the implementation of the Geneva Plan of Action and continue to report at the WSIS Forum.
18. ITU contributes annually to the Commission on Science and Technology for Development (CSTD), which has been mandated by ECOSOC to serve as the focal point in the system-wide follow-up to the outcomes of the WSIS.
19. Since 2009, ITU has planned, organized, and hosted the WSIS Forum in collaboration with the co-organizers, UNESCO, UNDP, and UNCTAD. The annual WSIS Forum is a global multistakeholder platform facilitating the implementation of the WSIS Action Lines. The WSIS Forum provides a multistakeholder platform for information exchange, knowledge creation and sharing of best practices, taking into account the evolving Information and Knowledge Societies.
20. Annual editions of the WSIS Forum, including outcome documents and session archives, are available at: www.wsis.org/forum.
21. In support of regional implementation, the UN Regional Commissions, in partnership with ITU, UNESCO, and UNDP, regularly organize WSIS regional workshops. These sessions aim to:



- Building regional capacity on the WSIS Implementation process and its alignment with 2030 Agenda
- Building awareness on the enabling role of ICTs in sustainable development
- Provide formal regional inputs to the WSIS Open Consultation Process
- Regional reporting on projects to the WSIS Stocktaking
- o Identification of possible projects for submission to the WSIS Prize competition
- Regional inputs to the WSIS Action Line facilitation process

b) Facilitator of the WSIS Action Lines C2, C4, C5, C6

Action Line C2: Information and Communication Infrastructure



Related to SDGs: SDG 1 (1.4), SDG 8 (8.2), SDG 9 (9.1, 9.a, 9.c), SDG 11 (11.5, 11.b)



22. Within the framework of the existing resources and given mandate, as well as in line with the Geneva Action Plan, the ITU carries out several activities with regard to the WSIS Action Line C2. ITU plans and activities are taking into consideration the approved [Resolution 70/1](#) (Transforming our world: the 2030 Agenda for Sustainable Development) where it was recognized that high-speed broadband is an essential enabler of sustainable development.
23. The ITU organized several notable events under the WSIS Action Line C2 (Information and communication infrastructure) in 2025. These events emphasized sustainable digital infrastructure, broadband access, and innovations to bridge the connectivity gap, especially in remote and underserved areas.
 - WSIS Forum Sessions (2023-2024): Both years featured dedicated sessions exploring innovative solutions for broadband deployment in rural areas. In 2024, specific discussions tackled the digital divide and sustainable digital transformation with a focus on emerging technologies, such as 5G and fiber access, that could address these needs in developing countries.
 - Workshops on Digital Public Infrastructure (DPI): In 2024, the DPI workshop highlighted best practices for digital governance and policy. The event encouraged knowledge-sharing around digital infrastructure to enhance inclusivity and accessibility globally, aligned with SDG goals.
 - Ministerial session on
24. The 20th Action Line C2 Facilitation Meeting was held on Tuesday, 8 July 2025, 11:30-12:30 CEST as an integral part of the WSIS+20 High-Level Event 2025. The title of the Action Line Facilitation meeting was: “The Role of Emerging Technologies and AI in

Advancing WSIS Action Line C2 Goals”. The discussion highlighted challenges associated with AI integration, including ethical considerations and equitable access. The session discussed strategies to ensure responsible and inclusive deployment of AI tools that benefit all communities while addressing the digital divide. For more details on the sessions and the outcomes, please see [here](#).

25. The WSIS Prizes 2025 Winner for the Action Line C2: “Internet para Todos” in Peru. Details of the project are available [here](#).

o The ITU has organized several regional workshops during 2024 and 2025, each targeting different aspects of ICT development and connectivity, and catering to a variety of stakeholders, including policymakers, regulators, and industry professionals. Here are a few highlights:

- [Regional Workshop on EMF Harmony](#): Held in Muscat, Oman, in May 2024, this workshop focused on balancing connectivity with safety standards related to electromagnetic fields (EMF). Topics included regulatory requirements, the impact of urban planning on ICT infrastructure, and methods for accurately assessing EMF exposure. It was designed for policymakers, health and safety experts, and regulators in the Arab region.
- [Workshop on Universal and Meaningful Connectivity \(UMC\)](#): This event took place in Doha, Qatar, in October 2024. It aimed to support policymakers and statisticians in promoting and measuring UMC, a concept that emphasizes affordable, equitable internet access. The agenda included discussions on data-driven decision-making and effective strategies for overcoming connectivity challenges, with participants encouraged to take ITU courses on ICT indicators before the event.
- [ITU Regional Development Forum for Africa \(3-5 October 2023\)](#) – Held in Addis Ababa, Ethiopia, this forum brought together stakeholders from across the region to discuss digital development strategies, aiming to drive Africa's digital transformation with inclusive and sustainable practices.
- Workshop on Co-Creating Sustainable Operating Models for Connected Schools (23 March 2023) – Conducted in Nairobi, Kenya, this event addressed sustainable approaches to connecting schools, part of ITU's broader effort to bridge educational divides through digital technology.
- 12th SG13 Regional Group-Africa (RG-AFR) virtual meeting (30 January 2025) –It included discussions on AI, machine learning as well as the standardization priorities to Africa. (Details are [here](#))

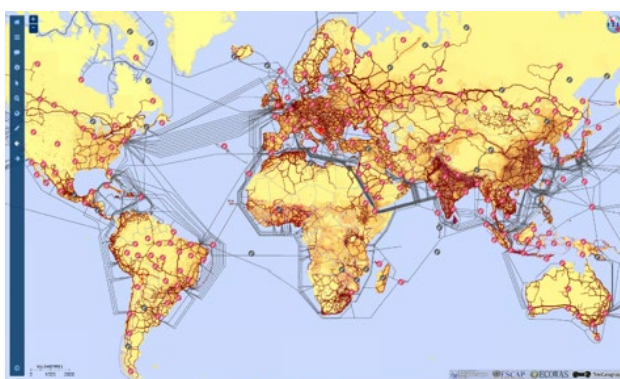
26. Some of the ITU major projects for 2023 and 2024 focus on global connectivity, cybersecurity, sustainable digital transformation, and advancing technology standards. Key initiatives include:

- Connect2Recover - Targeted at improving connectivity in underserved regions, this project focuses on building resilient digital infrastructure to bridge gaps in healthcare, education, and economic services through better network coverage and access.

- Cybersecurity Readiness Programs - ITU continues its work on enhancing cybersecurity, particularly with developing nations, by establishing policies, cybersecurity incident response teams, and a regulatory framework to mitigate risks and secure the digital environment.
 - Green Digital Action - Aligned with COP29 and other environmental goals, ITU's Green Digital Action project supports the development of sustainable ICT practices to combat climate change. This includes initiatives on energy-efficient digital technologies and climate-conscious data management.
 - Transformation for Sustainable Development - Under the ITU Strategic Plan for 2024-2027, this project supports the digital transformation of various sectors, aiming for inclusive digital access and addressing digital gaps, especially for marginalized communities.
 - Giga – aligned with the ITU, this is a joint initiative of ITU and UNICEF, that provides support to countries towards getting all schools connected to the Internet. Giga's global reach has grown, with its footprint reaching 45 countries engaged with Giga by October 2025 and a further 28 countries in the pipeline
27. During 2023 and 2024, ITU has released several significant publications that address AL C2 and various aspects of telecommunications, digital development, and policy frameworks. Here are some of the major publications:
- Launch of the ITU's Report on Digital Trends (2024): This report highlighted emerging digital trends and challenges, providing recommendations for policymakers to promote digital inclusion and innovation.
 - ICT Development Index 2023: This report assesses the extent of universal and meaningful connectivity globally, introducing a new methodology for evaluation. It covers 169 economies and is expected to inform stakeholders about connectivity disparities
 - Facts and Figures 2023: This flagship publication tracks global connectivity, highlighting disparities in digital access and the ongoing challenges faced by low-income countries. It includes new indicators for 5G network coverage and internet traffic.
 - Digital Innovation Profiles: Various profiles have been published for countries like Serbia, Georgia, and North Macedonia, offering insights into each country's digital landscape and strategic recommendations for improvement.
 - Connecting Every School in Indonesia: This publication assesses policies related to school connectivity initiatives in Indonesia and identifies gaps in infrastructure and funding.
 - Green Digital Companies 2025: This report examines the intersection of the digital industry and environmental challenges, focusing on monitoring emissions and climate commitments of 200 digital companies.
28. ITU-D works closely with the ITU Radiocommunication Sector (ITU-R) and ITU-T in all regions to develop infrastructure and services. Several countries were assisted in

preparing wireless broadband master plans, spectrum management master plans and national broadband policies for their transition from public switched telecommunication networks to next-generation networks.

29. ITU Global Development Initiatives are supporting the implementation of SDGs, such as: the [m-Powering Development for a Better Tomorrow](#) that is an innovative and unique ITU initiative. The goal is to extend the benefits of mobile telephony to all strata of society, in order to build a truly inclusive information society, with special focus on remote rural and underserved areas; The [Smart Sustainable Development Model initiative](#) aims at linking rural telecommunications development for general communications, business, education health and banking to disaster risk reduction and disaster management initiatives, to ensure an optimal use of technology and avoid duplication of efforts and investments.
30. To identify the global perspective of broadband connectivity that allows the ICT community to identify broadband placement, gaps and evidence-based investment opportunities, the ITU Interactive Transmission Map is continuously adding geospatial data of network links from all regions. The maps are a cutting-edge [ICT-data mapping platform](#) to take stock of national backbone connectivity (Optical fiber, Microwave links and Satellite Earth Stations) as well as of other key metrics of the ICT sector, which currently covers all regions of the globe.
31. Implementation and updates of the ITU Interactive Terrestrial Transmission Maps (<http://itu.int/go/map-publics>) is ongoing. The ITU Maps present critical ICT infrastructure on broadband backbone optical fiber, microwave links, satellite earth stations, and submarine cables. The Map interface was renewed to allow new data visualizations and data analytics. The Maps allow for graphical improvements proposals, wireframes for smartphone and tablet applications, and dashboard and statistics. Video and demonstrations for events have been developed ready to be deployed.
32. At the time of this reporting, the Map presented information from 600 operator networks. The research on the transmission links has reached 20 million km of routes. Submarine cables, information on IXPs and satellite earth stations have been updated.
33. In order to enhance the Interactive Terrestrial Transmission Map worldwide, ITU coordinated the data collection and validation process covering infrastructure of more than 190 countries. The geospatial is being used to assess connectivity gaps and is feeding different connectivity models from ITU initiatives (e.g. GIGA, C2R, FIGI) to support investment decisions according to user profile (schools, financial inclusion, health centers, etc.).



34. ITU-D has made available a computer program known as **SMS4DC** (Spectrum Management System for Developing Countries) to assist administrations of developing countries in performing their spectrum management responsibilities more effectively. ITU has kept updating this program and more than 40 countries have subscribed to the **tool**. Further developments to the SMS4DC are underway covering administrative and radiocommunication functions. Technical assistance and training programs were provided in this area to several countries and regions.
35. The capacity of ITU members was enhanced on a range of network issues through numerous activities. Direct assistance was provided to multiple countries from all regions in frequency planning, spectrum management master plans, creation of National Table of Frequency Allocations, the transition from analogue to DTTV broadcasting and other technical issues. Some of the examples of such assistance programs are provided below.
36. Assistance on conformity and interoperability has been provided to developing countries. A C&I Assessment Study follow-up for the Caribbean Region targeting young IoT entrepreneurs and the challenges to reach compliance and market. Regional training events have been organized together with testing laboratory partners for AMS, ASP and AFR.
37. The ITU/Craig and Susan McCaw Broadband Wireless Network project is under implementation in Africa covering several countries (Burkina Faso, Burundi, Rwanda, Swaziland, etc.). The wireless broadband connectivity and developing ICT applications will provide free or low-cost digital access for schools and hospitals, and for underserved populations in rural and remote areas in those countries.
38. The procurement of ICT equipment is under way in Burkina Faso as part of the Broadband Wireless Network project.
39. Broadband Wireless Network for Djibouti was completed for Phase 2 and the maintenance contract was finalized and signed by Djibouti Telecom.
40. Procurement for the Broadband Wireless Network in Mali is in progress. The international call for Proposals has been done. The technical evaluation is following.
41. Basic National Spectrum Management System is to assist developing countries to establish basic structure of spectrum management system. Projects for Comoros, Bolivia and Kyrgyzstan were finished. The results of the assistance are the workplan for countries for implementing/updating their spectrum management structures and activities.
42. IPv6 and IoT (Internet of Things) Expertise Center: The Project document has been signed with MUST (Malaysia University of Science and Technology) to assist developing countries. Following the cooperation agreement between the ITU and Malaysia University of Science (MUST), procurement is under process for the



equipment, software and training material as required for the Implementation of an IPv6 and IoT (Internet of Things) in Penang Malaysia. 3 Trainings have been organized.

43. Project to set up IPv6 and IoT expertise centre in Sudan has been signed.
44. As part of ITU Europe's Technical Assistance on IPv6 for Montenegro, the University of Montenegro is set to open its IPv6 Laboratory on the 27th of September 2023. In 2021, ITU supported Montenegro in constructing a National Workshop dedicated to IPv6 strategies and also included a training session aimed at equipping over 20 professionals. This was achieved in collaboration with the Mirpur University of Science and Technology (MUST) and the Government of Montenegro, in conjunction with the Agency for Electronic Communications and Postal Services of Montenegro (EKIP).
45. As part of ITU Europe's Technical Assistance, over the past year, the ITU Office for Europe has been involved in providing technical assistance to various countries in the region, particularly focusing on broadband mapping systems in Albania and Moldova. In Albania, the Office for Europe developed detailed specifications to upgrade the ATLAS platform, improving data collection and analysis to optimize broadband investments. In Moldova, tailored support was provided to create a system that visualizes broadband infrastructure data, helping to identify coverage gaps and guide investments interoperable with the existing register of physical infrastructure (ROITE). Additionally, through the Global Symposium for Regulators (GSR), the Office for Europe shared best practices globally, including supporting the Africa-BB-Maps project to enhance digital infrastructure across the continent. The Africa-BB-Maps project aims to enhance digital infrastructure across the continent by helping African nations adopt broadband mapping systems that improve data transparency and support strategic investments in connectivity.
46. The ITU Office for Europe supported Montenegro in developing its National Broadband Plan 2025-2029, focusing on expanding rural broadband coverage, improving service quality, and aligning with EU digital goals. This guidance ensured the plan adheres to international best practices, contributing to the country's digital transformation.
47. Following the joint declaration signed at the GSR23, the ITU Office for Europe, in partnership with the European Mediterranean Regulators Group (EMERG) and the Eastern Partnership Electronic Communications Regulators Network (EaPeReg), is hosting a series of six workshops on "Strengthening Broadband Infrastructure and Services across the Europe Region and beyond". The fourth workshop was held on 25 July 2024, aimed to advance broadband mapping by showcasing case studies, sharing best practices, and exploring new features of mapping tools, including investment opportunities layers.
48. As part of the ITU's Europe's Technical Assistance, ITU is set to provide support and elaborate detailed technical specifications allowing the Electronic and Postal Communications Authority (AKEP) in upgrading and expanding its spectrum monitoring system in Albania. This enhancement will improve AKEP's capabilities in

frequency planning, engineering, licensing, and enforcement, ensuring the new monitoring system adheres to international standards and best practices.

49. Under Resolution 1408 on “Assistance and support to Ukraine for rebuilding their telecommunication sector”. ITU Special Task Force on Resolution 1408, established at the level of the General Secretariat and serviced by the ITU Office for Europe, continues to provide the platform for intersectoral response to all issues related to the implementation of this Resolution. ITU is in regular coordination with the Ukrainian Administration on the activities related to the implementation of the Resolution 1408. As a member of the UN Country Team, ITU continues to coordinate all its action with the UN system in the country. ITU continues to use Partner2Connect mechanism to collect pledges dedicated to support Ukraine as well as continues to mobilize funds under the Special Fund in Trust, facilitating the scale up of ITU's operations related to further implementation of Resolution 1408. In line with the implementation of the ITU Council Resolution 1408 ITU, in cooperation with the State Service of Special Communications and Information Protection of Ukraine (SSSCIP) and the Broadcasting, Radiocommunications and Television Concern, carried out the assessment of the Rehabilitation Costs for 10 Stations of the Broadcasting Network of Ukraine. The reports present 10 initial bankable project proposals for the rehabilitation and reconstruction of the stations with a build-back-better approach.
50. Upon the request presented by the National Commission for the State Regulation of Electronic Communications, Radio Frequency Spectrum and the Provision of Postal Services of Ukraine, the ITU designed an **Executive Training Program on 5G roll-out for Ukrainian officials**. As part of the ITU's capacity-building activities, the ITU Europe Office team organized five sessions from March to July 2024 that served for Ukrainian representatives as the platform for learning and exchanging the experience with three ITU sectors, representatives of Polish, Lithuanian, and Romanian National authorities, representatives from Nokia and Ericsson.
51. On 29 March 2023, a Roundtable on SDG 9 and 17 was held by the UN Digital Transformation Group for Europe and Central Asia with the lead of ITU Europe Office, as part of the Regional Forum on Sustainable Development for the UNECE Region. This hybrid event was held both online and physically at the WMO Premises in Geneva, Switzerland. The first session of the roundtable addressed Universal access to internet connectivity looking at the critical solutions to developing robust and reliable ICT infrastructure that can provide universal, affordable, and safe connectivity. The session includes representatives from the E-Government Agency of, Moldova, the Ministry of Digital Development, Innovation and Aerospace Industry of Kazakhstan, the Action for Sustainable, UN Women, the Permanent Mission of Poland to the United Nations in Geneva, and UN Women Regional Office for Europe and Central Asia.
52. In accordance with WTDC Resolution 47 (Rev. Buenos Aires, 2017), regional forums, assessment studies and on-the-job training courses on C&I are planned for 2020 with the participation of several countries in the regions.

53. Several modules of Training material for C&I (CITP) have been prepared and others are under preparation.
54. Capacity of ITU members was built and training programs were organized in such areas as telecommunication/ICT network issues, including conformance & interoperability, digital terrestrial television, IPv6, SMS4DC, spectrum management and allocation, frequency planning and coordination, etc.
55. Direct assistance was provided regarding frequency planning, spectrum management structures and activities, the transition from analogue to digital terrestrial television broadcasting, conformance and interoperability, and future Internet exchange.
56. Furthermore, ITU develops a number of the large scale regional projects focusing on regional initiatives facilitating development of the information and communication infrastructure. More information on these projects as well as the other projects can be found [ITU-D Projects webpage](#).
57. In the framework of ITU-D Study Groups, the following questions related to AL-C2 were approved by WTDC-17 with working mandate until 2021:
 1. [Question 1/1](#): *Strategies and policies for the deployment of broadband in developing countries*
 2. [Question 2/1](#): *Strategies, policies, regulations and methods of migration and adoption of digital broadcasting and implementation of new services*
 3. [Question 5/1](#): *Telecommunications/ICTs for rural and remote areas*
 4. [Question 4/2](#): *Assistance to developing countries for implementing conformance and interoperability (C&I) programmes and combating counterfeit ICT equipment and theft of mobile devices*
 5. [Question 7/2](#): *Strategies and policies concerning human exposure to electromagnetic fields*
58. As an input document to Question 1/1 and Question 2/1 in the 2014-2017 cycle, ITU has contributed with a Report on Implementation of Evolving Telecommunication/ICT Infrastructure for Developing Countries: Technical, Economic and Policy Aspects. The report introduces essential telecommunication/ICT infrastructures and their technologies, economic and policy aspects supporting effective adoption of Next-generation Networks, and it is [available online](#). ITU Toolkit on Business Planning for ICT Infrastructure development was prepared and a training based on this toolkit is running in 26 October-11 December 2020.
59. ITU is contributing to bridging the standardization gap between developing and developed countries. Instructed by [PP-14 Resolution 123](#), [WTSA-24 Resolution 44](#), and the [WTDC-14 Recommendation 22](#) on Bridging the Standardization Gap (BSG), regional workshops and other regional activities are receiving support from ITU Regional Offices to improve awareness, understanding and participation on the development of ICT standards developed by global and regional Standardization Development Organizations (SDOs).

60. In the implementation of Action Line C2, ITU continues to be at the forefront of providing global standards for telecommunication in areas such as broadband access and home networks and infrastructures for ultra-high-speed transport; as well as future networks including 5G and networking innovations in fields such as network slicing, fixed mobile convergence, information centric networking, software-defined networking, machine learning as applied to 5G, cloud computing, data management, and trusted network infrastructure. Since 1 September 2023, ITU-T [approved more than 200 texts](#) (as of 29 July 2024), including ITU-T Recommendations, Supplements and Technical Reports.
61. ITU continues its activities related to combating counterfeit telecommunication/ICT devices/software and mobile device theft. ITU hosted a series of webinars and workshops with panelist from international organizations including WIPO, WTO, and OECD to facilitate collaboration on this topic. ITU promotes its activities and maintains dialogue via regional events in developing countries. In October 2025, in Tunis, ITU organized the [fourth regional Workshop for Africa](#) titled “Strengthening ICT Integrity: Combating Counterfeits, Testing Challenges, and Fraudulent Communications in the Africa Region”. The workshop addressed challenges in the African region related to counterfeiting and discussed the CEIR deployment, which is intended to assist in preventing the circulation of counterfeit devices in the area. In line with this, SG11 is developing draft Recommendation ITU-T Q.5055 which defines technical requirement, interfaces and generic functions of the Central Equipment Identity Register (CEIR). Also, in February 2025, SG11 approved Recommendation ITU-T Q.5054 which defines consumer centric framework for combating counterfeit and stolen ICT mobile devices (see [ITU News](#)). More details about all related activities and standards on this subject matter are available on dedicated webpage at: <https://itu.int/go/CS-ICT>.
62. The ITU [Last Mile Connectivity Solutions Guide](#) was developed to help accelerate actions to address last-mile Internet connectivity issues in situations that include a lack of network infrastructure and with a view to encouraging more affordable service delivery. The tools, service interventions and policy solutions reflect how to extend Internet access to areas and users in geographies without Internet while considering their unique characteristics. The Solutions Guide is designed for use during initial consultations on how to address these gaps and includes reference materials, resources and links to other content to support the process, dialogue and decision-making that accompanies intervention design.
63. To complement this Solutions Guide, a range of resources is developed to help Member States address last-mile connectivity challenges, including a database of case studies ([LMC Case Studies Database](#)) and [capacity-development courses on last mile connectivity](#). In addition, interactive last-mile connectivity diagnostic and decision-making tools are being developed that includes methodologies for technology selection and cost estimation for building broadband access networks in localities or connecting schools, hospitals or other specific objects to broadband transport backbones.

64. [Emerging technology trends: Artificial intelligence and big data for development 4.0](#): contains hands-on guidelines for policy-makers and other stakeholders in crafting a national AI and data strategy for development. The report also identifies the main building-blocks of a national AI and data system for development (governance; regulation; ethics; digital and data skills; the digital environment and data infrastructure; the innovation system; AI and data-intensive sectors; and international collaboration).
65. New graphical interface of the ITU Interactive Transmission Maps is under development.
66. Results of ITU-T study groups on Action Line C2 are:
 - [ITU-T D.212 \(revised\) “Charging and Accounting Principles for The Use of Signalling System No. 7”](#) defines charging and accounting principles for the use of Signalling System No. 7.
 - **ITU-T D.265 “Principles for Tariff Regulation of Data Services” (under approval)** covers principles of tariff regulation on data services. Members States and NRAs should consider the use of these principles to ensure equitable access to the Internet and transparent pricing practices beneficial to consumers and operators of data services. These guidelines are a starting point for telecommunications /ICTs regulators. Member States and NRAs should take into account their specific national or regional conditions when using this Recommendation.
 - [ITU-T D.285 \(revised\) “Guiding principles for charging and accounting for intelligent network supported services”](#) outlines general considerations and guiding principles for charging and international accounting for traffic and facilities used to support services that utilize Intelligent Networking (IN) capabilities.
 - **ITU-T D.609R “Guidelines for determining the size of fees associated with authorizations/licences” (under approval)**: This Regional Recommendation provides guidelines for determining the size of fees associated with authorizations/licenses.
 - [ITU-T D.700R “Principles for dealing with OTTs”](#): The scope of this Recommendation are over-the-top (OTT) services that can be regarded as potentially competing with or substituting for traditional telecommunications and audio-visual services such as voice telephony, short message service (SMS), and video calling. This Recommendation seeks to provide guidance to Arab States in relation to the global growth of OTTs in view of ensuring fair competition, consumer protection, dynamic innovation, sustainable investment and infrastructure development, accessibility and affordability of services to the largest part of population.
 - [ITU-T D.1040 Amd.1 -Appendix I “Method of re-allocating the circuit capacity in the trans-multi-country terrestrial cable in a complex scenario”](#) may face more complicated scenario in the real world, i.e. after the circuit capacity has been allocated and some of the circuits have been used, the length of the TTC is extended because the existing party contributes more cable or a new country joins

in. This Appendix explains how to re-allocate the circuit capacity in the above-mentioned case.

- **ITU-T D.1141 “Policy framework and principles for data protection in the context of big data relating to telecommunication/ICT services” (under approval)** proposes a policy framework and a set of principles for the protection of Personally Identifiable Information (PII) in the context of big data relating to international telecommunication/ICT services.
- [ITU-T E.156 \(revised\) “Guidelines for ITU-T action on reported misuse of E.164 number resources”](#) outlines the procedures for reporting and taking action regarding alleged misuse of numbers. It also outlines the procedures that the Director of the Telecommunication Standardization Bureau should undertake upon receipt of reports of alleged misuse from members, including methods to address and counter any alleged misuse when such reports are brought to the attention of the Director.

Amendment 1 (2020) includes Appendix IV, which reproduces verbatim the attachment to WTS Resolution 61 (Rev. Dubai, 2012) on "Suggested guidelines for regulators, administrations and operating agencies authorized by Member States for dealing with number misappropriation".

- [ITU-T E.164.2 “ITU-T E.164 numbering resources for trials”](#) contains the criteria and procedures for an applicant to be temporarily assigned a three-digit identification code within the shared ITU-T E.164 country code 991 for the purpose of conducting an international non-commercial trial. The purpose of the trial will be to determine the viability of a proposed new international public correspondence service.
- [ITU-T E.190 \(revised\) “Principles and responsibilities for the allocation, reservation, assignment, reclamation and management of ITU-T international naming, numbering, addressing and identification \(NNAI\) resources”](#) contains the principles and responsibilities used in the allocation, assignment, reclamation and management of International Naming Numbering Addressing and Identification resources, e.g. Recommendations E.164, E.118.1, E.218 and E.212, under the auspices of the appropriate ITU-T study group.
- [ITU-T E.212 \(revised\) “The international identification plan for public networks and subscriptions”](#) defines a unique international identification plan for public fixed and mobile networks providing users with access to public telecommunication services. The ITU-T E.212 identification plan was originally developed for use in public land mobile networks (PLMNs). The plan is hierarchical and identifies geographic areas, networks and subscriptions. The main body of this Recommendation describes the pure identification plan.
- [ITU-T E.218 \(revised\) “Management of the allocation of terrestrial trunk radio Mobile Country Codes”](#) specifies the structure of the terrestrial trunk radio ITSI, and describes the manner by which the ITU-TSB shall allocate and manage the (T)MCC. The administration of the (T)MNC by a National Administration is a national matter and is therefore outside of the scope of this Recommendation. The 2023 revision of

this Recommendation clarifies the conditions for reclamation in the case of non-payment of membership fees as well as amending Clause 2.

- [ITU-T E.813 “Mapping and visualization strategies for the assessment of connectivity”](#) defines a high-level framework for mapping and visualization strategies that include guidelines to define first how to identify and measure the level of connectivity and secondly tools and functionalities that are useful in representing the status of this connectivity.
- [ITU-T E.1120 “Assignment processes for ITU-T International resources”](#) specifies processes to be used by an applicant, the Telecommunication Standardization Bureau (TSB), and ITU-T Study Group 2 (SG2), for assignment of: – ITU-T E.164 identification codes (ICs) associated within the shared country codes (CCs) for networks category of ITU-T E.164, whose combination is designated CC + IC. – ITU-T E.212 shared mobile country codes for networks and their respective mobile network codes. – [ITU-T E.118 global issuer identifier numbers (IINs). – ITU-T E.118.1 ITU-T management of the allocation of globally assigned Issuer Identifier Numbers (IINs)– ITU-T E.218 shared terrestrial trunk radio access mobile network codes. The naming, numbering, addressing and identification (NNAI) resources identified in the preceding list can be described as “global”.
- [ITU-T E.1121 “Mechanisms and processes for audits of assigned ITU-T international naming, numbering, addressing and identification \(NNAI\) resources”](#): The purpose of this recommendation is to provide the means and mechanism by which audits are performed, by which role, and for what reason. In addition, the recommendation in identifying the process for the audit will identify the result of non-compliance by a global identifier assignee.
- [ITU-T F.740.3 “Metadata for digital representation of cultural relics/artworks using augmented reality”](#): Augmented reality cultural service system (ARCSS) is a kind of digital interpretation system based on augmented reality (AR), it is able to present a story or history behind the cultural relics/artworks in a dynamic and actual fusion way. This Recommendation describes the information flows of Augmented reality cultural service, including AR content creation information flow and AR content display information flow. Based on the information flows, this Recommendation specifies the metadata for digital representation of cultural relics/artworks using augmented reality.
- [ITU-T F.740.4 “Metadata for image aesthetics assessment with aesthetic attributes in mobile terminal computational photography systems”](#): Image aesthetics assessment (IAA) aims to evaluate whether an image conforms to the aesthetic preferences of a potential audience. This Recommendation defines metadata for image aesthetics assessment with aesthetic attributes in a mobile terminal computational photography system. The metadata is divided into three dimensions according to the key roles: photographer, camera and viewer, and provides non-redundant, fundamental and representative aesthetic attributes of each dimension. The role-based metadata defined in this Recommendation can be used to guide the construction of IAA datasets, and to provide multiple aesthetic

attributes evaluation for IAA. Moreover, sample collection requirements and qualifications for annotators are recommended to guide high quality data construction.

- [ITU-T F.740.5 “Data collection and annotation requirements for automatic white balance \(AWB\) enhancement in mobile terminal for digital culture”](#) provides the collection procedure of data for automatic white balance (AWB) enhancement and describes the requirements for all steps, which includes the requirements for scene selecting, shooting setting, data capturing and illumination uniformity detecting. The requirements of data annotation are also described in this Recommendation, including the illumination colour, illumination indicator and device. The goal of this Recommendation is to improve the user experience during image data transmission, which is the most popular cultural behaviour.
- [ITU-T F.740.6 “Reference framework and requirements for Internet protocol multimedia subsystem early media and extension service systems”](#): The scope of Specifying the technical requirements and extended application scenarios of the Early Media is the primary task of standardization based on which this proposal proposes the application scenarios and requirements of Early Media service.
- [ITU-T F.740.7 “Reference architecture and requirements for mobile terminal computational photography systems”](#) specifies a reference architecture for mobile terminal computational photography system, which includes three functional blocks, namely optical imaging block, image processing block and application block. This recommendation also describes requirements for the mobile terminal computational photography system. This Recommendation can facilitate cooperation between manufactures, and enhance developing efficiency, so as to provide end users better photography experiences. The aim is to define the reference architecture and requirements for the mobile terminal photography system.
- [ITU-T F.740.8 “Requirements and architecture for live virtual tour system using panoramic video and augmented reality”](#): The purpose of this Recommendation is to define a live virtual tour system using panoramic video and augmented reality. By using the panoramic video and augmented reality technologies, the live virtual tour system can enable network users to experience the remote tour by watching the immersive multimedia content and using the related interactive functions. This Recommendation describes the requirements and architecture for the live virtual tour system using panoramic video and augmented reality.
- [ITU-T F.742.2 “Functional architecture for distance learning services”](#) specifies the functional architecture for distance learning services.
- [ITU-T F.743.23 “Security requirements for video surveillance systems”](#) defines premises unit (PU) device security classification, functional requirements, typical use case and scenario for video surveillance systems. The Recommendation specifies the functional requirements, including PU access security requirements, transmission security requirements, platform security requirements, application

security requirements, network security and security management centre in video surveillance systems.

- [ITU-T F.743.24 “Scenarios and requirements for DLT in video surveillance system interworking”](#) provides the overview of the video surveillance system interworking based on distributed ledger technology, and defines the application scenarios and capability requirements for DLT in video surveillance system interworking, to realize interoperability, high-reliability and high-efficiency of identity authentication and authorization of video surveillance system interworking (VSSI).
- [ITU-T F.743.25 “Procedures and requirements for multimedia data asset management”](#) specifies a data asset management framework with its corresponding objects, activities and supports in a high level. In order to manage data assets effectively so that the value of multimedia data assets can be maintained and added, there should be a standard procedure to manage multimedia data assets. The procedures can help different enterprises to identify, recognize, share, exchange, and apply multimedia data assets in a unified and standardized way. This Recommendation contains the procedures for the life cycle management of multimedia data assets. The procedures include multimedia data asset catalogue management, identification, registration, application, inventory check, change, assessment, and disposal. It also provides the detailed requirements for each part of the procedures, and the use cases for how these processes can be applied are also provided in the appendix.
- [ITU-T F.743.26 “Technical requirements of cloud gaming platform based on IMT-2020 mobile edge computing”](#) specifies the technical requirements of cloud gaming platform based on IMT-2020 mobile edge computing. It defines the deployment, technical requirements for operations functionality within the cloud gaming platform, technical requirements for service capability functionality within the cloud gaming platform, technical requirements for cloud computing platform and network, and security requirements. The Recommendation aims to utilize the technical advantages of IMT-2020 mobile edge computing to provide a reference for the development and deployment of the cloud gaming platform.
- [ITU-T F.744.5 “Requirements for content delivery networks based on P2P technology”](#) describes the requirement for a peer-to-peer content delivery network (P2P CDN). It specifies the overall functional architecture, domains and functional role relationships, functional blocks and their mutual relationships, service provision requirement, availability requirement, scalability requirement and security considerations. P2P CDN provides a scalable and elastic CDN function pool of shareable terminal devices computing resources, storage resources and uplink bandwidth to save loads of current CDN and improve user experience.
- [ITU-T F.746.18 “Requirements for interactive low-latency multimedia transmission system over the Internet”](#) specifies the functional requirements of interactive low-latency multimedia transmission system (ILMTS) over the Internet. It identifies the key functional requirements from the different aspects, such as service level, application level and management level, etc. According to those requirements, this

Recommendation also introduces a reference framework of ILMTS. Some use cases are described in the Appendix at the end of this Recommendation. With this Recommendation, the service providers who provide the interactive live content delivery service with low-latency media delivery are able to design a standardized real-time multimedia service system by following the requirements defined in this Recommendation.

- [ITU-T F.747.13 “Requirements and reference framework of cloud-edge collaboration in industrial machine vision systems”](#): specifies requirements and reference framework of cloud-edge collaboration in industrial machine vision systems, and provides use cases. The cloud-edge collaboration is a process (or method) that coordinates cloud computing and edge computing, dynamically allocates required computing, algorithm models, data, or other resources, and jointly completes the same tasks (or objectives) agreed in advance. In industrial machine vision systems, the cloud-edge collaboration includes resource collaboration (computing, network, and storage), service collaboration (data, intelligence, and task), and application collaboration (capability and management). This Recommendation is intended to guide the design and development of industrial machine vision systems.
- [ITU-T F.747.14 “Requirements and capability framework of the multimodal fusion system for vision”](#): With the big data and artificial intelligence explosive development, some new modal data for vision is appeared, like Lidar data, Radar data, and 3D data and so on. Multimodal fusion for vision is one new technology for higher quality human eye presentation or higher performance machine vision tasks. Multimodal fusion system for vision will be popular in the future vision system. Meanwhile the multimodal fusion system focuses on the specific methods of multimodal data fusion. This Recommendation specifies the requirements and capability framework to accommodate the existing and newly developed visual facilities for multimodal fusion for vision applications including autonomous vehicles, autonomous robots’ navigation and weather visibility prediction. This Recommendation defines the related requirements, capability framework, and reference use cases for the multimodal fusion system for vision.
- [ITU-T F.747.15 “Requirements of event-based vision systems”](#): With the advantages of high time-domain resolution, less data redundancy, low power consumption, and high dynamic range, the event-based vision system (EV-SYS) can be used in power consumption sensitive, high-speed movement and extreme lighting scenarios, such as high-speed industrial detection, autonomous driving, video surveillance, high-speed imaging and robot vision. Since the EV-SYS has differences in signal acquisition, coding, transmission, analysis, and application compared to traditional camera-based intelligent vision due to the asynchronous output, the traditional vision algorithms cannot be applied. None of the existing machine vision standards has developed based on EV-SYS. The EV-SYS will be used in high-speed motion scenarios beyond the existing standards. This Recommendation provides the related requirements and reference use cases for EV-SYS.

- [ITU-T F.748.22 “Functional architecture for feature-based distributed intelligent systems”](#) defines the architecture, the functional entities, and the reference points for feature-based distributed intelligent systems.
- [ITU-T F.748.23 “Requirements and framework for intelligent crowdsensing multimedia interaction based on deep learning”](#): Artificial intelligence (AI) techniques can greatly improve the efficiency and effectiveness of crowdsensing tasks execution and enable intelligent multimedia interaction in crowdsensing. Recommendation ITU-T F.748.23 outlines specific scenarios for crowdsensing multimedia interaction that leverage AI techniques, and subsequently defines the corresponding requirements and framework in detail.
- [ITU-T F.748.24 “Trusted contribution evaluation framework on federated machine learning services”](#) introduces a trusted contribution evaluation service on federated machine learning service which converges and takes advantage the technologies of FML and DLT, and provides relevant concept, characteristics, and requirements and use cases, and specifies relevant reference framework and common capabilities.
- [ITU-T F.748.25 “Requirements for speech interaction of intelligent customer services”](#) describes the scenarios, high-layer level architecture, functional requirements and performance requirements for speech interaction of intelligent customer service. Some detailed use cases and reference process of the creation of the knowledge base are described in the appendix.
- [ITU-T F.748.26 “Technical specification for artificial intelligence cloud platforms: Performance evaluation”](#) provides a comprehensive performance evaluation framework for artificial intelligence cloud platform. It covers the overview of the evaluation framework, configuration specification, workloads, metrics, requirements on evaluation results and evaluation suggestions. It can be a unified guideline for developers, users, third-party test agency, and researchers to analyse and access the performance of AI cloud platforms.
- [ITU-T F.748.27 “Framework and requirements for the construction of 3D intelligent driven digital human application systems”](#): Multimedia services are becoming increasingly useful for education, video-based marketing, digital museum, E-health, etc., providing an enriched user experience in e-meetings, distance training and product demonstrations. Digital twin realizes the interconnection, intercommunication and interoperability between the physical world and the digital world, constructs the description, diagnosis, prediction and decision-making of the physical world in the virtual world. At present, the digital twin system in different multimedia services has common requirements and functions, and it is necessary to develop a digital twin platform to realize the services for upper multimedia applications. The digital twin platform provides general services, twin services, interactive services for multimedia applications such as the fields of education, video-based marketing, digital museum, E-health, etc. This Recommendation specifies the requirements and functional architecture of digital twin platform for supporting multimedia services.

- [ITU-T F.748.29 “Framework and requirements of computer audition based machinery fault diagnosis systems”](#): Building intelligent machinery fault diagnosis systems is essential for preventing unexpected breakdowns of machinery, thus enhancing production efficiency and ensuring safety during operations. The integration of computer audition into machinery fault diagnosis systems can detect subtle faults imperceptible to vision through non-destructive ways. This Recommendation specifies the basic concept of computer audition, and identifies the framework and requirements of computer audition based machinery fault diagnosis systems.
- [ITU-T F.748.30 “Requirements of communication services for digital humans”](#): Digital human technology is developing rapidly and is being used in various fields. This document defines the communication services for digital humans and the requirements for developing and utilizing digital humans. This document defines entities and their roles in communication services for digital humans, interaction and communication types between entities, and describes human and digital human communication service types. It also defines the concept model for communication services for digital humans. Emotions and memories are needed for perfect communication, and digital human communication also requires emotions and memories. This document also define requirements of communication services of digital human using emotions and memory.
- [ITU-T F.748.34 “Requirements for the construction of multimedia knowledge graph database structure based on artificial intelligence”](#) specifies the requirements for effectively constructing a knowledge graph database capable of processing multimedia data using artificial intelligence technology. It specifies the framework and requirements for the construction of the multimedia knowledge graph database.
- [ITU-T F.748.35 “Requirement and framework of trustworthy federated machine learning based service”](#): Federated machine learning (FML) is an emerging distributed machine learning paradigm that enables collaborative model training, learning, utilizing and construction from a large number of distributed datasets on the basis of ensuring data security and legal compliance. It performs where the computing is where the data, and data available is not visible and so is data computing. There are some challenges for FML-based services in aspects of trust for they work in distributed or decentralized environments. All the challenges are often brought about by a lack of trust in the multiple participants of FML-based services, usually in the progresses of model training and utilizing, such as data indexing, data computing, parameter exchanging, etc. Specific functional components are needed to enhance the trustworthiness of FML-based services, such as to enhance dataset indexing, data computing, parameter exchanging, and model utilization. Distributed ledger technology (DLT) system can be as one type of trustworthy shared data system to store the data of FML-based service as well. Convergence between FML and those components can make benefits for FML-based service, especially for helping for addressing the challenges for FML-based services in aspects of trust. This Recommendation provides a trustworthy FML-

based service, and specifies its concept, general characteristics and requirements and reference framework.

- [ITU-T F.748.36 “Requirements and framework of multi-algorithm scheduling systems”](#) specifies the requirements and framework of the multi-algorithm scheduling (MAS) systems for artificial intelligence (AI)-based multimedia applications. The MAS systems consist of the scheduling unit, the algorithm warehouse unit, and the computing power resource management unit. The MAS systems schedule multiple algorithms (multi-type, multi-version, or from multiple providers) across heterogeneous computing power resources based on specific tasks on-demand. This Recommendation is intended to guide the design, development, application and implementation of the MAS systems for AI-based multimedia applications.
- [ITU-T F.748.37 “Requirements and functional framework of joint semantic query system of unstructured data across clusters”](#) specified the requirements and framework for joint semantic query system of unstructured data across clusters, enabling efficient and rapid query of unstructured data without change the physical location of the data.
- [ITU-T F.748.38 “Technical specification for artificial intelligence cloud platform: General architecture”](#) provides technical specifications and capability requirements for artificial intelligence cloud platform. This recommendation specifies the capabilities of artificial intelligence cloud platforms from service providers in the following six aspects: resource management, model development, model deployment, high availability, performance, and platform security.
- [ITU-T F.749.8 “In-vehicle multimedia applets: Framework and functional requirements”](#) describes the VMMA concept, the VMMA framework, the functional requirements, the functional APIs and the reference parameters. Some detailed use cases and reference APIs are described in the appendix.
- [ITU-T F.749.18 “Framework and requirements for emergency services using civilian unmanned aerial vehicles”](#): When emergency occurs, there are always two critical things to consider: to find the survivors and to reduce the loss, but it's dangerous and difficult for human beings to observe or enter the scene in time. With CUAVs which carry base stations or observation equipment (such as cameras, sensors), administrators can easily analyse the situation and make decisions. This Recommendation provides the framework and requirements for emergency services using civilian unmanned aerial vehicle, which meets the need of emergency use cases.
- [ITU-T F.751.9 “Trusted execution environment based confidential computing on distributed ledger technology systems”](#) specifies a trusted execution environment based confidential computing on distributed ledger technology system: decomposes user’s confidentiality demand into concrete requirements of each step during DLT service utilization; analyses detailed security requirements and technical requirements of trusted execution environment based confidential computing to guarantee the confidentiality in the life cycle of a transaction from

end to end; addresses the framework of trusted execution environment based confidential computing, as well as detailed procedures to realize security requirements and technical requirements.

- [ITU-T F.751.10 “Framework and requirements for DLT-based digital collection services”](#): DLT-based digital collection services are provided by DLT system to perform different operations towards digital collections, including issuance, sale, purchase, auction, transaction, transfer etc. This Recommendation specifies framework and requirements for DLT-based digital collection services, and it may be used to guide the DLT-based digital collection services.
- [ITU-T F.751.11 “Performance test suite for distributed ledger technology systems”](#) provides a performance test suite for DLT system based on assessment criteria proposed in ITU-T F.751.1 and ITU-T F.751.6. This Recommendation specifies the basic principles and main dimensions of the performance testing for DLT system, and provides a suit of test cases, which can help users quantitatively and objectively analyses the performance of DLT system with different test environment comprehensively, and find the most suitable path to improve the performance.
- [ITU-T F.751.13 “Framework and requirements for distributed ledger technology-based distributed power trading systems”](#) proposes a distributed power transaction reference architecture based on DLT, so that the distributed power DLT can be built on the framework of common technology, so that it can be developed and expanded in a sustainable manner and reduce the cost of enterprise access. This document divides the roles and activities of participating subjects, clarify the responsibilities and obligations of each participating subject, and avoid unclear rights and responsibilities. This document provides contract templates for different transaction modes, standardize contract objects and data structures, and avoid repeated design and development. This Recommendation specifies the framework and requirements for the distributed power trading (DPT) system based on distributed ledger technology (DLT). The framework includes the infrastructure layer, the interface layer, and the application layer.
- [ITU-T F.751.14 “Reference architecture for information tracing of renewable energy consumption based on distributed ledger technology”](#) defines the relevant participants, tracing process and reference architecture for the renewable energy consumption information traceability (RECT) system based on distributed ledger technology (DLT). It provides guidance for users and demanders, who choose DLT for renewable energy consumption information traceability.
- [ITU-T F.751.15 “Assessment methods for distributed ledger technology \(DLT\) management service platforms”](#) provides the assessment methods for DLT-MSP and the assessment criteria cover DLT layer, management layer, business layer. The description of each test case is composed of test purpose, test workflows and expected results.
- [ITU-T F.751.16 “Reference framework for distributed ledger technology \(DLT\) management service platforms”](#) specifies the reference framework for distributed

ledger technology management service platforms (DLT-MSP). The framework includes resource layer, DLT layer, management layer, business layer, application layer, and security layer. Additionally in the framework, it provides functionalities for DLT layer, management layer and business layer. This Recommendation can be used as a guideline for DLT-MSP development and assessment.

- [ITU-T F.751.18 “Framework for DLT-based energy metering data sharing”](#): In order to provide better support for energy applications such as carbon emission and green certificate based on trustworthy energy metering data, this Recommendation specifies a framework for distributed ledger technology (DLT) -based energy metering data sharing and it provides functional modules of the DLT-based energy metering data sharing platform.
- [ITU-T F.751.19 “Framework and requirements for distributed ledger technology based on sharding technique”](#): Sharding technique helps to improve the scalability of DLT system, including the transaction processing throughput and ledger storage capacity, without compromising the decentralization and security. This Recommendation specifies the framework and technical requirements for distributed ledger technology based on sharding technique, and it can be used as a guideline to perform DLT system scalability.
- [ITU-T F.751.20 “Reference architecture for DLT-based multimedia data delivery management systems”](#) specifies the reference architecture for DLT-based multimedia data delivery management systems including three subsystems and the related high level requirements to solve the problems of quality assurance and trusted sharing of multimedia data, support the construction of a traceable value and revenue distribution system and the corresponding multimedia data applications and services.
- [ITU-T F.751.21 “Technical Requirements on inter-chain interoperability for permissioned distributed ledger technologies”](#): In order for data exchanging and sharing in different DLTs systems, this Recommendation specifies general flows of the inter-chain interoperability between the different DLT systems, functional requirements of the inter-chain interoperability and general requirements of the inter-chain interoperability for the DLT systems. This Recommendation may be used for guiding the design and implementation inter-chain interoperability for DLT system.
- [ITU-T F.751.22 “Financial distributed ledger technology application guideline”](#) specifies the application guideline of financial distributed ledger technology (DLT). It provides: - General principles from five aspects; - Reference architecture from both the participant and conceptual architecture views; - Technical requirements, including functionality, performance, security, governance, maintenance, auditability and interoperability; - Use cases in trade finance and supply chain finance to illustrate how DLT can be used more reasonably and effectively for financial applications according to this guideline.
- [ITU-T F.760.2 “Guidelines for user interface of first responders in emergency response support systems”](#) provides requirements for the user interface for first

responders in emergency response support systems, which facilitates the use of information and devices supporting the activities of first responders at the scene of an emergency. This Recommendation identifies the human factors in emergency response services and the user interface requirement in emergency response support systems based on the characteristics of first response activities. These user interface requirements are specified to support the functional modules and usability of emergency response support systems for first responders. By meeting these requirements, developers can create user interfaces that are optimized to support the needs and tasks of first responders, resulting in more effective and efficient use of the system.

- [ITU-T G.191 \(revised\) “Software tools for speech and audio coding standardization”](#) provides source code for speech and audio processing modules for narrowband, wideband and super-wideband telephony applications. The set includes codecs, filters, noise generators. This edition introduces changes to Annex A, which describes the ITU-T Software Tools (STL) containing a high-quality, portable C code library for speech processing applications.
- [ITU-T G.650.1 \(revised\) “Definitions and test methods for linear, deterministic attributes of single-mode fibre and cable”](#) contains definitions of the linear, deterministic parameters of single-mode optical fibres and cables. It also contains both reference test methods and alternative test methods for characterizing these parameters. These test methods are suitable mainly for factory measurements of the linear, deterministic attributes of single-mode fibres and cables. Some of the test methods may also be used to characterize discrete optical components.
- **ITU-T G.652 (revised) “Characteristics of a single-mode optical fibre and cable” (under approval)** describes the geometrical, mechanical and transmission attributes of a single-mode optical fibre and cable which has zero-dispersion wavelength around 1310 nm. The ITU-T G.652 fibre was originally optimized for use in the 1310 nm wavelength region, but can also be used in the 1550 nm region. This is the latest revision of a Recommendation that was first created in 1984 and deals with some relatively minor modifications. In this revision, example guideline for the statistical chromatic dispersion coefficient in a link with a number of concatenated cable pieces of M equals 1 to 16 is provided in the clause I.6 of Appendix I.
- **ITU-T G.654 (revised) “Characteristics of a cut-off shifted single-mode optical fibre and cable” (under approval)** describes the geometrical, mechanical and transmission attributes of a single-mode optical fibre and cable which has the zero-dispersion wavelength around 1 300 nm wavelength, and which is loss-minimized and cut-off wavelength shifted at around the 1 550 nm wavelength region.
- **ITU-T G.657 (revised) “Characteristics of a bending-loss insensitive single-mode optical fibre and cable” (under approval)**: It is the aim of Recommendation ITU-T G.657 to support this optimization by recommending strongly improved bending performance compared with the existing [ITU-T G.652] single-mode fibre and cables. This is done by means of two categories of single-mode fibres, one of which, category A, is fully compliant with the [ITU-T G.652] single-mode fibres and

can be deployed throughout the general transport and datacenter networks as well as the access network. The other, category B, is not necessarily compliant with Recommendation [ITU-T G.652], but is capable of low values of macrobending losses at very low bend radii and is intended for application in the access network inside buildings or near buildings (e.g., outside building riser cabling). These category B fibres are system compatible with ITU-T G.657.A (and [ITU-T G.652.D]) fibres in access networks. This fifth edition of Recommendation ITU-T G.657, amongst other things, extends the application space for G.657 fibre and merges category B2 into category A2.

- [ITU-T G.698.5 “Multichannel DWDM applications with single-channel optical interfaces in the O-band”](#) provides optical parameter values for physical layer interfaces of dense wavelength division multiplexing (DWDM) systems primarily intended for mobile fronthaul and metro applications in the O-band, optimized for 10-km and 20-km transmission distances. Applications are defined using optical interface parameters and values for single-channel interfaces of multichannel wavelength division multiplexing (WDM) optical systems in point-to-point applications.
- [ITU-T G.698.6 “Multichannel WDM applications with single-channel optical interfaces in the O-band”](#) provides optical parameter values for physical layer interfaces of wavelength division multiplexing (WDM) systems primarily intended for mobile fronthaul and metro applications in the O-band, optimized for 5-km transmission distances. Applications are defined using optical interface parameters and values for single-channel interfaces of multichannel WDM optical systems in point-to-point applications.
- [ITU-T G.781 \(revised\) “Synchronization layer functions for frequency synchronization based on the physical layer”](#) defines the atomic functions that are part of the two synchronization layers, the synchronization distribution (SD) layer and the network synchronization (NS) layer. It also defines some atomic functions, part of the transport layer, which are related to synchronization. These functions describe the synchronization of SDH, Ethernet, and OTN NEs and how these NEs are involved in network synchronization. The specifications in this Recommendation are the superset of functionality of three regional standards bodies.
- [ITU-T G.872 \(revised\) “Architecture of the optical transport network”](#) describes the functional architecture of the optical transport network (OTN) using the modelling methodology described in Recommendations ITU-T G.800, ITU-T G.805 and ITU-T G.807. The OTN functionality is described from a network level viewpoint, taking into account, the characteristic information of clients of OTN, client/server layer associations, networking topology, layer network functionality and optical media network structure, which provide multiplexing, routing and supervision of digital clients.
- [ITU-T G.709/Y.1331 \(2020\) Amd.3 “Interfaces for the optical transport network - Amendment 3”](#) defines the requirements for the optical transport network (OTN)

interface signals of the optical transport network, in terms of: – OTN hierarchy – functionality of the overhead in support of multi-wavelength optical networks – frame structures – bit rates – formats for mapping client signals. Edition 6.5 (Amendment 3) of this Recommendation adds mapping of 800GBASE-R clients, clarifications to the description of GMP, and a new fine-grained path layer and tributary slot structure.

- [ITU-T G.709.1/Y.1331.1 \(2018\) Amd.4 “Flexible OTN short-reach interfaces - Amendment 4”](#) adds definitions for FlexO frames using 800 Gb/s physical interfaces, including mapping of Ethernet directly to FlexO (without defining an associated FEC frame), modifications related to 100 Gb/s per lane signalling for FlexO-1 and FlexO-4, (i.e., FOIC1.1, FOIC4.4), editorial clarifications related to renaming Pad overhead as Extended overhead, reorganization of the FlexO frame description to enable potential use of different types of FEC frames for beyond 400G interfaces, and additional overhead to support new FlexO applications.
- [ITU-T G.709.1 \(revised\) “Flexible OTN common elements”](#) specifies common elements and signal structures used by various types of FlexO interfaces. Edition 3.0 removes short-reach interfaces which are moved to [ITU-T G.709.5]. This Recommendation is renamed and focuses on common FlexO elements.
- **ITU-T G.709.1 (2024) Amd.1 “Flexible OTN common elements - Amendment 1” (under approval)** specifies common elements and signal structures used by various types of flexible optical transport network (FlexO) interfaces. Edition 3.0 removes short-reach interfaces which are moved to Recommendation ITU-T G.709.5. This Recommendation is renamed and focuses on common FlexO elements. Amendment 1 to G.709.1 adds FlexO level deskewing functionality.
- [ITU-T G.709.3 \(revised\) “Flexible OTN B100G long-reach interfaces”](#) specifies 100G, 200G and 400G FlexO Beyond 100G (B100G) long-reach interfaces. The Recommendation specifies the structure using forward error correction codes with a higher coding gain suitable for longer reach applications, and references common elements from [ITU-T G.709.1] and FEC structures from [ITU-T G.709.2]. Edition 3 contains the following extensions to Edition 2.1: – Removal of FlexO-1-SC and FOIC1.k-SC interface – Move of OTUCn GMP mapping procedure to G.709.1.
- [ITU-T G.709.5 “Flexible OTN short-reach interfaces”](#) specifies 100G, 200G, 400G and 800G FlexO short-reach interfaces. The Recommendation specifies the structure using forward error correction code with a coding gain suitable for short-reach applications, and references common elements from [ITU-T G.709.1].
- **ITU-T G.709.5 (2024) Amd.1 “Flexible OTN short-reach interfaces - Amendment 1” (under approval)** specifies 100G, 200G, 400G and 800G flexible optical transport network (FlexO) short-reach interfaces. This Recommendation specifies the structure using forward error correction (FEC) code with a coding gain suitable for short-reach applications, and references common elements from Recommendation ITU-T G.709.1. Amendment 1 to G.709.5 adds a new FOIC1.2-RS optical short reach interface.

- [ITU-T G.709.6 “Flexible OTN B400G long-reach interfaces”](#) specifies 400G and 800G FlexO Beyond 400G (B400G) long-reach interfaces. The Recommendation specifies the structure using forward error correction codes with a higher coding gain suitable for longer reach applications, and references common elements from [ITU-T G.709.1] and FEC structures from [ITU-T G.709.3].
- [ITU-T G.709.20 “Overview of fine grain OTN”](#) provides an overview of functions provided by the fine grain OTN (fgOTN) layer network and identifies Recommendations where the functions are defined.
- **ITU-T G.781 (2024) Amd.1 “Synchronization layer functions for frequency synchronization based on the physical layer - Amendment 1” (under approval)** defines the atomic functions that are part of the two synchronization layers, the synchronization distribution (SD) layer and the network synchronization (NS) layer. It also defines some atomic functions, part of the transport layer, which are related to synchronization. These functions describe the synchronization of synchronous digital hierarchy (SDH), Ethernet, and optical transport network (OTN) network elements (NEs) and how these NEs are involved in network synchronization. The specifications in this Recommendation are the superset of functionality of three regional standards bodies.
- [ITU-T G.798 \(revised\) “Characteristics of optical transport network hierarchy equipment functional blocks”](#) specifies both the components and the methodology that should be used in order to specify the optical transport network (OTN) functionality of network elements; it does not specify individual optical transport network equipment.
- [ITU-T G.798 \(2023\) Amd.1 “Characteristics of optical transport network hierarchy equipment functional blocks - Amendment 1”](#) specifies both the components and the methodology that should be used in order to specify the optical transport network (OTN) functionality of network elements; it does not specify individual optical transport network equipment.
- **ITU-T G.798 (2023) Amd.2 “Characteristics of optical transport network hierarchy equipment functional blocks - Amendment 2” (under approval)** specifies both the components and the methodology that should be used in order to specify the optical transport network (OTN) functionality of network elements; it does not specify individual optical transport network equipment. Amendment 2 to Recommendation ITU-T G.798 (2023) adds FlexOxR and FlexOnM layer atomic functions to support FlexO regenerator applications, adds ODUflexP to ETC800GR adaptation function, adds fgOTN layer atomic functions to support fine-grained OTN applications, makes some editorial changes.
- **ITU-T G.807 (revised) “Generic functional architecture of the optical media layer” (under approval)** describes the generic functional architecture of the optical media layer that supports the propagation of signals in the context of a transport network. This description is independent of the client characteristic information (CI) that is being carried by a signal in the media network. Amendment 1 removes the dependence on the ITU-T G.694.1 grid, names the reference point

between the digital layer and the modulator/demodulator and uses M-AI/Client CI to replace digital-lane/digital-client. Revision 2 changes the name of modulator/demodulator to transmitter/receiver, includes the subcarrier and point-to-multipoint cases.

- **ITU-T G.808.4 “Linear protection for fine grain Metro Transport Network (fgMTN) and fine grain Optical Transport Network (fgOTN)” (under approval)** defines the operation of linear protection switching schemes for both fine grain Metro Transport Network (fgMTN) layer network and fine grain Optical Transport Network (fgOTN) layer network, including the automatic protection switching (APS) protocol.
- [ITU-T G.874 \(2020\) Amd.2 “Management aspects of optical transport network elements - Amendment 2”](#) addresses management aspects of optical transport network (OTN) elements containing transport functions of one or more of the layer networks of the OTN. The management of optical layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management (CM) and performance monitoring are specified.
- [ITU-T G.876 \(2021\) Amd.1 “Management Requirements and Information Model for the optical media network - Amendment 1”](#) Amendment 1 to G.876 specifies the management architecture, the management of OTN optical media layer and the management of Ethernet media layer.
- **ITU-T G.876 (2021) Amd.2 “Management requirements and information model for the optical media network - Amendment 2” (under approval)** describes the management requirements and the information model for network elements (NEs) that contain optical media layer functions defined by ITU-T equipment Recommendations based on the ITU-T G.807 architecture, e.g., Recommendation ITU-T G.798. The management requirements are based on Recommendation ITU-T G.7710, and the information model is based on ITU-T G.7711 object classes.
- [ITU-T G.959.1 \(revised\) “Optical transport network physical layer interfaces”](#) provides physical layer inter-domain interface (IrDI) specifications for optical networks which may employ wavelength division multiplexing (WDM). The IrDIs within the optical transport network (OTN) are provided by unidirectional, point-to-point, single and multichannel line systems. Their primary purpose is to enable transversely compatible interfaces to span the boundary between two administrative domains.
- **ITU-T G.959.1 (2024) Amd.1 “Optical transport network physical layer interfaces - Amendment 1” (under approval)** provides physical layer inter-domain interface (IrDI) specifications for optical networks which may employ wavelength division multiplexing (WDM). The IrDIs within the optical transport network (OTN) are provided by unidirectional, point-to-point, single and multichannel line systems. Their primary purpose is to enable transversely compatible interfaces to span the boundary between two administrative domains. The IrDI specifications include intra-office, short-haul and long-haul applications, without line amplifiers. This version of this Recommendation includes single-

channel interfaces suitable for FOIC1.1-RS with PAM4 100G. Amendment 1 to Recommendation ITU-T G.959.1 (2024) includes an updated definition of OTSi and defines new terms T-OTSi, R-OTSi and OTScSi.

- **ITU-T G.971 (revised) “General features of optical fibre submarine cable systems” (under approval)** applies to optical fibre submarine cable systems. The purpose of this Recommendation is to identify the main features of optical fibre submarine cable systems, and to provide generic information on relevant Recommendations in the field of optical fibre submarine cable systems. A common implementation relevant to all the optical fibre submarine cable systems is described in Annex A. Specific information relevant to each optical fibre submarine cable system is included in annexes of other Recommendations. The updated data on cable ships and submersible equipment of various countries are also described in Appendix I.
- **ITU-T G.972 (revised) “Definition of terms relevant to optical fibre submarine cable systems” (under approval)** applies to optical fibre submarine cable systems. The purpose of this Recommendation is to provide definitions of terms relevant to optical fibre submarine cable systems, including terms relevant to system configuration, system aspects, terminal equipment, optical submarine repeaters and branching units, optical fibre submarine cable, manufacturing and installation, and the maintenance of the submarine portion. Appendix I is the alphabetical list of terms defined in this Recommendation. In this latest version, terms and definitions introduced by new Recommendations G.9730.1 and G.9730.2 are added. All the terms that the definitions were for further study have been added as well.
- [ITU-T G.988 \(2022\) Amd.1 “ONU management and control interface \(OMCI\) specification - Amendment 1”](#) specifies the optical network unit (ONU) management and control interface (OMCI) for optical access networks. Recommendation ITU-T G.988 specifies the managed entities (MEs) of a protocol-independent management information base (MIB) that models the exchange of information between an optical line termination (OLT) and an ONU. In addition, it covers the ONU management and control channel, protocol and detailed messages.
- [ITU-T G.1051 Amd.1 “Latency measurement and interactivity scoring under real application data traffic patterns - Amendment 1”](#) describes latency measurement and interactivity scoring under real application data traffic patterns.
- [ITU-T G.1052 “Testbed framework for mobile application QoS and QoE evaluation”](#) proposes a testbed setup and a methodology to evaluate the QoE of the multiple 5G and beyond mobile use cases. A testbed, its calibration, and a testing methodology are described, able to provide consistent and repeatable results in an automated fashion. A key focus of the setup is the use of commercial devices and applications, aiming at making results more valuable by mimicking the setup of a real user. This document focuses on cellular 3GPP networks. A similar setup could

be thought of using other technologies, e.g., Wi-Fi, also interoperating to emulate inter-RAT handovers, although it will not be covered here.

- [ITU-T G.1092 “Taxonomy of telemeetings from a QoE perspective”](#) provides a taxonomy on the different possible types of telemeetings, focussing on aspects that are crucial for Quality of Experience (QoE) assessment. The purpose is to facilitate the selection of appropriate quality assessment methods as well as an appropriate reporting and interpretation of results.
- **ITU-T G.7701 (2022) Amd.1 “Common control aspects - Amendment 1” (under approval)** describes the concepts and the aspects of management control components that are common to the use of either software defined networking (SDN) and automatically switched optical network (ASON) approaches to the management of a transport network. It also describes the common aspects of the interaction between the management-control functions and the transport network resources. Amendment 1 adds a clause on interaction between SDN and ASON MC systems, and transport resources and other MC systems. Clause 14 on topology and discovery was moved from G.7703 and made common to all MC systems.
- **ITU-T G.7702 (2022) Amd.1 “Architecture for SDN control of transport networks - Amendment 1” (under approval)** describes the reference architecture for software defined networking (SDN) control of transport networks applicable to both connection-oriented circuit and/or packet transport networks. This architecture is described in terms of abstract components and interfaces that represent logical functions (abstract entities versus physical implementations). Amendment 1 describes the name space, resource and component distribution within one SDN controller, and aligns with the clause structure in G.7701.
- **ITU-T G.7703 (2021) Amd.2 “Architecture for the automatically switched optical network -Amendment 2” (under approval)** describes the reference architecture and requirements for the automatically switched optical network (ASON) as applicable to connection-oriented circuit or packet transport networks. This reference architecture is described in terms of the key functional components and the interactions between them. Amendment 2 aligns with Recommendation ITU-T G.7701, which specifies common control aspects for both ASON and software defined networking (SDN) architecture. This amendment refers to Recommendation ITU-T G.7701 common clauses.
- **ITU-T G.7718 (2020) Amd.2 “Framework for the management of management-control components and functions - Amendment 2” (under approval)** contains the framework for ASON management. It places automatically switched optical network (ASON) management within the TMN context and specifies how the TMN principles may be applied. A management view of the ASON control plane is developed. This view provides the bases for the ASON management requirements specified in this Recommendation. Identifier spaces needed in ASON management are specified. Examples of management system structures and ASON related management applications are contained in the appendices.

- [ITU-T G.8021/Y.1341 Amd.1 “Characteristics of Ethernet transport network equipment functional blocks - Amendment 1”](#) specifies both the functional components and the methodology that should be used in order to specify the Ethernet transport network functionality of network elements; it does not specify individual Ethernet transport network equipment.
- [ITU-T G.8023 Amd.2 “Characteristics of equipment functional blocks supporting Ethernet physical layer and Flex Ethernet interfaces - Amendment 2”](#) specifies both the functional components and the methodology that should be used in order to specify the Ethernet physical layer and Flex Ethernet interfaces.
- **ITU-T G.8051 (revised) “Management aspects of the Ethernet transport (ET) capable network element” (under approval)** addresses management aspects of the Ethernet transport (ET) capable network element containing transport functions of one or more of the layer networks of the Ethernet transport network. The management of the Ethernet layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management, performance monitoring and security management are specified.
- [ITU-T G.8052 \(revised\) “Protocol-neutral management information model for the Ethernet transport capable network element”](#) 8052 contains the protocol neutral UML information model for Ethernet transport network (NE) management. The model is based on the Ethernet equipment functions specified in Recommendation ITU-T G.8021, generic management requirements in Recommendation ITU-T G.7710, and Ethernet specific management requirements in Recommendation ITU-T G.8051.
- [ITU-T G.8052.1/Y.1346.1 \(2021\) Amd.2 “Operation, administration, maintenance \(OAM\) management information and data models for the Ethernet-transport network element - Amendment 2”](#) specifies the management information model and data models for Ethernet transport network element (NE) to support specific interface protocols and specific management control (MC) functions. The information model is interface protocol neutral and specified using the unified modelling language (UML). The information model of this Recommendation is derived through pruning and refactoring from Recommendation ITU-T G.7711/Y.1702 core information model and Recommendation ITU-T G.8052/Y.1346 foundation Ethernet transport NE information model.
- [ITU-T G.8121/Y.1381 Amd.1 “Characteristics of MPLS-TP equipment functional blocks - Amendment 1”](#) specifies both the functional components and the methodology that should be used in order to specify multi-protocol label switching – transport profile (MPLS-TP) layer network functionality of network elements; it does not specify individual MPLS-TP network equipment as such. Amendment 1: Provides new Annex A “Mapping MPLS-TP packets to OTN using IMP” Replaces Maintenance Communication Channel (MCC) by Management Communication Channel (MCC) Makes editorial corrections in Figure 11-37 to Figure 11-40

(replacing ETH_FP by ETH_AP) and Table 11-17 Updates the publication dates in References.

- **ITU-T G.8151 (revised) “Management aspects of the MPLS-TP network element” (under approval)** addresses management aspects of the multi-protocol label switching (MPLS) transport profile (MPLS-TP) capable network element containing transport functions of one or more of the layer networks of the MPLS-TP network. The management of the MPLS-TP layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management, performance monitoring and security management are specified.
- [ITU-T G.8151/Y.1374 \(2020\) Amd.1 “Management aspects of the MPLS-TP network element - Amendment 1”](#) addresses management aspects of the multi-protocol label switching (MPLS) transport profile (MPLS-TP) capable network element containing transport functions of one or more of the layer networks of the MPLS-TP network.
- [ITU-T G.8152 \(revised\) “Protocol-neutral management information model for the MPLS-TP network element”](#) contains the protocol neutral unified modelling language (UML) model for multi-protocol label switching – transport profile (MPLS-TP) network element (NE) management. This Recommendation provides a representation of the MPLS-TP technology using the methodologies that have been used for other transport technologies (e.g., SDH, OTN and Ethernet).
- **ITU-T G.8152.1/Y.1375.1 (2021) Amd.2 “Operation, administration, maintenance (OAM) management information and data models for the MPLS-TP network element - Amendment 2” (under approval)** specifies the operation, administration, maintenance (OAM) information model and data models for multi-protocol label switching – transport profile (MPLS-TP) transport network element (NE) to support specific interface protocols and specific management and control functions. The information model is interface protocol neutral and derived from the ITU-T G.8152/Y.1375 foundation MPLS-TP NE information model. The data models are interface protocol specific and translated from the information model with the assistance of an automated translation tool.
- **ITU-T G.8152.2/Y.1375.2 (2021) Amd.2 “Resilience information/data models for the MPLS-TP network element - Amendment 2” (under approval)** specifies resilience management information and data models for a multi-protocol label switching-transport profile (MPLS-TP) network element (NE) as specified in Recommendations ITU-T G.8131 and ITU-T G.8132. The information model is interface protocol neutral and specified using the unified modelling language (UML).
- **ITU-T G.8251 (2022) Amd.1 “The control of jitter and wander within the optical transport network (OTN) - Amendment 1” (under approval)** specifies the maximum network limits of jitter and wander that shall not be exceeded and the minimum equipment tolerance to jitter and wander that shall be provided at any

relevant interfaces which are based on the optical transport network (OTN). The requirements for the jitter and wander characteristics that are specified in this Recommendation must be adhered to in order to ensure interoperability of equipment produced by different manufacturers and a satisfactory network performance. Amendment 1 to Recommendation ITU-T G.8251 includes the following change: – Add fgOTN timing specification. – Replace the OCh term with OTSi and OTSiG. – Remove non-inclusive terms.

- [ITU-T G.8260 \(2022\) Amd.1 “Definitions and terminology for synchronization in packet networks - Amendment 1”](#) provides the definitions, terminology and abbreviations used in ITU-T Recommendations on timing and synchronization in packet networks. Amendment 1 to ITU-T G.8260 (11/2022) provides the following updates: - Updated definitions with consideration given to the use of this terminology in metrology - New Appendix II “Time scales” added - New Appendix III “Clarifications on the term traceability” added - New references added to Bibliography - Revised terminology based on inclusive language.
- **ITU-T G.8262 (revised) “Timing characteristics of synchronous equipment clock” (under approval)** outlines requirements for timing devices used in synchronizing network equipment that uses the physical layer to deliver frequency synchronization. This Recommendation defines the requirements for clocks, e.g., bandwidth, frequency accuracy, holdover and noise generation.
- [ITU-T G.8264/Y.1364 \(2017\) Amd.2 “Distribution of timing information through packet networks - Amendment 2”](#) outlines aspects of distribution of timing information through packet networks and initially focuses on Ethernet networks. A number of methods may be used to transfer frequency which may be physical-layer based or protocol-layer based. This Recommendation provides information on architectural aspects of timing flows in Ethernet networks which will form the basis for future work related to time and phase transfer. This Recommendation specifies the synchronization status message (SSM) protocol and formats for use with synchronous Ethernet.
- **ITU-T G.8265.1/Y.1365.1 (2022) Amd.1 “Precision time protocol telecom profile for frequency synchronization - Amendment 1” (under approval)** contains the ITU-T precision time protocol (PTP) profile for frequency distribution without timing support from the network (unicast mode). It provides the necessary details to utilize IEEE 1588 in a manner consistent with the architecture described in Recommendation ITU-T G.8265/Y.1365.
- **ITU-T G.8271 (2020) Amd.1 “Time and phase synchronization aspects of telecommunication networks - Amendment 1” (under approval)** defines time and phase synchronization aspects in packet networks. It specifies the suitable methods to distribute the reference timing signals that can be used to recover the phase synchronization and/or time synchronization according to the required quality. The requirements for the synchronization characteristics that are specified in this Recommendation must be adhered to in order to ensure interoperability of

equipment produced by different manufacturers and a satisfactory network performance.

- [ITU-T G.8271.1/Y.1366.1 \(2022\) Amd.2 “Network limits for time synchronization in packet networks with full timing support from the network - Amendment 2”](#) specifies the maximum network limits of phase and time error that shall not be exceeded. It specifies the minimum equipment tolerance to phase and time error that shall be provided at the boundary of packet networks at phase and time synchronization interfaces. It also outlines the minimum requirements for the synchronization function of network elements. This Recommendation addresses the case of time and phase distribution across a network by a packet-based method with full timing support to the protocol level from the network.
- [ITU-T G.8272.1 \(revised\) “Timing characteristics of enhanced primary reference time clocks”](#) specifies the requirements for enhanced primary reference time clocks (ePRTC) suitable for time and phase synchronization in packet networks. It defines the error allowed at the time output of the ePRTC. These requirements apply under the normal environmental conditions specified for the equipment.
- [ITU-T G.8272.2 “Timing characteristics of coherent network primary reference time clocks”](#) specifies the requirements for coherent network primary reference time clocks (cnPRTC) suitable for time, phase and frequency synchronization in networks. These requirements apply under the normal environmental conditions specified for the equipment.
- **ITU-T G.8273.2 (2023) Amd.1 “Timing characteristics of telecom boundary clocks and telecom time synchronous clocks for use with full timing support from the network - Amendment 1” (under approval)** specifies minimum requirements for time and phase for telecom boundary clocks and telecom time synchronous clocks used in synchronization network equipment that operates in the network architecture as defined in Recommendations ITU-T G.8271, ITU-T G.8271.1, ITU-T G.8275 and ITU-T G.8275.1. It supports time and/or phase synchronization distribution for packet-based networks. This version of the Recommendation only applies to full timing support from the network. These requirements apply under the normal environmental conditions specified for the equipment.
- **ITU-T G.8273.3 (2020) Amd.1 “Timing characteristics of telecom transparent clocks for use with full timing support from the network - Amendment 1” (under approval)** defines the minimum requirements for telecom transparent clocks (T-TCs). These requirements apply under normal environmental conditions specified for the equipment. This Recommendation includes: clock accuracy, noise generation, noise tolerance, noise transfer, and transient response for T-TCs.
- **ITU-T G.8273.4 “Timing characteristics of telecom boundary clocks and telecom time synchronous clocks for use with partial timing support from the network” (under approval)** specifies minimum requirements for time and phase synchronization equipment used in synchronization networks that operates in the

assisted partial timing support (APTS) and partial timing support (PTS) architectures.

- [ITU-T G.8275 \(revised\) “Architecture and requirements for packet-based time and phase distribution”](#) describes the architecture and requirements for packet-based time and phase distribution in telecom networks. The architecture described is mainly applicable to the use of IEEE 1588. Details necessary to utilize IEEE 1588 in a manner consistent with the architecture are defined in other Recommendations.
- **ITU-T G.8275 (2024) Amd.1 “Architecture and requirements for packet-based time and phase distribution - Amendment 1” (under approval)** describes the architecture and requirements for packet-based time and phase distribution in telecom networks. The architecture described is mainly applicable to the use of IEEE 1588. Details necessary to utilize IEEE 1588 in a manner consistent with the architecture are defined in other Recommendations.
- [ITU-T G.8275.1/Y.1369.1 \(2022\) Amd.1 “Precision time protocol telecom profile for phase/time synchronization with full timing support from the network - Amendment 1”](#) contains the ITU-T precision time protocol (PTP) profile for phase and time distribution with full timing support from the network. It provides the necessary details to utilize [IEEE 1588] in a manner consistent with the architecture described in Recommendation [ITU-T G.8275].
- **ITU-T G.8275.1/Y.1369.1 (2022) Amd.2 “Precision time protocol telecom profile for phase/time synchronization with full timing support from the network Amendment 2” (under approval)** contains the ITU-T precision time protocol (PTP) profile for phase and time distribution with full timing support from the network. It provides the necessary details to utilize [IEEE 1588] in a manner consistent with the architecture described in Recommendation [ITU-T G.8275].
- [ITU-T G.8275.2/Y.1369.2 \(2022\) Amd.1 “Precision time protocol telecom profile for phase/time synchronization with partial timing support from the network - Amendment 1”](#) specifies a profile for telecommunication applications based on [IEEE 1588] precision time protocol (PTP). The profile specifies the IEEE 1588 functions that are necessary to ensure network element interoperability for the delivery of accurate phase/time (and frequency) synchronization. The profile is based on the use of partial timing support (PTS) or assisted partial timing support (APTS) from the network architecture as described in [ITU-T G.8275] and definitions described in [ITU-T G.8260].
- **ITU-T G.8275.2/Y.1369.2 (2022) Amd.2 “Precision time protocol telecom profile for phase/time synchronization with partial timing support from the network - Amendment 2” (under approval)** specifies a profile for telecommunication applications based on [IEEE 1588] precision time protocol (PTP). The profile specifies the IEEE 1588 functions that are necessary to ensure network element interoperability for the delivery of accurate phase/time (and frequency) synchronization. The profile is based on the use of partial timing support (PTS) or assisted partial timing support (APTS) from the network architecture as described in [ITU-T G.8275] and definitions described in [ITU-T G.8260].

- [ITU-T G.8310 \(2020\) Amd.1 “Architecture of the metro transport network - Amendment 1”](#) describes the functional architecture of the metro transport network (MTN) using the modelling methodology described in Recommendations ITU-T G.800 and ITU-T G.805. MTN is primarily intended to support transport of distributed radio access network (D-RAN) and cloud radio access network (C-RAN) traffic. The MTN functionality is described from a network level viewpoint, taking into account the client characteristic information, client/server layer associations, networking topology, and layer network functionality that provide multiplexing, routing and supervision of the digital clients.
- [ITU-T G.8312 \(2020\) Amd. 2 “Interfaces for metro transport networks - Amendment 2”](#) describes a transport technology for metro networks (MTNs), including transport of distributed radio access network (D-RAN) and centralized radio access network (C-RAN) traffic. This technology leverages existing and emerging pluggable Ethernet modules and reuses flex Ethernet (FlexE) implementation logic.
- **ITU-T G.8312 (2020) Amd.3 “Interfaces for metro transport networks - Amendment 3” (under approval)** describes a transport technology for metro networks (MTNs), including transport of distributed radio access network (D-RAN) and centralized radio access network (C-RAN) traffic. This technology leverages existing and emerging pluggable Ethernet modules and reuses flex Ethernet (FlexE) implementation logic. Amendment one adds several clarifications and also provides test vectors. Amendment two adds an annex to describe the fine grain MTN path and the associate elements. Amendment three adds a new annex A subclause and appendix V to describe the method of mapping CBR clients into fgMTNP and a new annex B to describe the fine grain MTN path hitless resizing mechanism.
- [ITU-T G.8312.20 “Overview of fine-grain MTN”](#) provides an overview of the functions provided by the fine-grain MTN (fgMTN) layer network and identifies the Recommendations where the functions are defined.
- **ITU-T G.8312.20 (2024) Amd.1 “Overview of fine grain MTN - Amendment 1” (under approval)** provides an overview of the functions provided by the fine grain MTN (fgMTN) layer network and identifies the Recommendations where the functions are defined. Amendment 1 to Recommendation G.8312.20 updates the overview of fgMTN recommendation series to include the fgMTN protection and equipment recommendations.
- **ITU-T G.8321 (2022) Amd.1 “Characteristics of metro transport network equipment functional blocks - Amendment 1” (under approval)** specifies both the components and methodology that should be used in order to specify the metro transport network (MTN) functionality of network elements; it does not specify individual MTN equipment. Amendment 1 to Recommendation ITU-T G.8321 (2022) adds Annex A that specifies new atomic functions to align with Amendment 2 to Recommendation ITU-T G.8312, including a new path layer fgMTNP.
- [ITU-T G.8350 \(2022\) Amd.1 “Management and Control of metro transport networks - Amendment 1”](#) specifies management and control requirements and a protocol-

neutral management information model for managing metro transport networks and their elements.

- **ITU-T G.9730.1 “Dedicated scientific sensing submarine cable system” (under approval):** Submarine scientific sensing activities including the measurement of temperature, pressure, vibration, acceleration, salinity, etc, are important for climate monitoring and disaster risk reduction. Dedicated submarine cable sensing systems have been constructed around the world. Recommendation ITU-T G.9730.1 is concerned with the dedicated submarine cable system for scientific sensing applications. It covers the aspects related to submarine cable system architecture, functional blocks, interfaces between various set of sensors and optical fibre submarine cable.
- **ITU-T G.9730.2 “Scientific monitoring and reliable telecommunications submarine cable systems” (under approval)** Recommendation identifies the capabilities and features of fibre optical submarine telecommunication cable systems equipped with scientific monitoring sensors along the length of the undersea optical cables (i.e., SMART cables). It describes at a high-level characteristics and requirements of a SMART cable system (e.g., no interference between telecommunications and sensing functions, reliability of each function, operations and maintenance, general attributes of a power and communication interface).
- **ITU-T G.9802 (2015) Amd.2 “Multiple-wavelength passive optical networks (MW-PONs) - Amendment 2” (under approval)** continues the maintenance and evolution of the specification of multiple wavelength passive optical network (MW-PON) systems.
- **ITU-T G.9804.1 Amd.2 “Higher Speed Passive Optical Networks: Requirements - Amendment 2”** serves as a guide for the development of higher speed passive optical network (PON) systems, by identifying sets of applications that can be addressed by a particular system and defining the requirements for each of those systems. It is anticipated that they may have several distinct systems, such as higher speed single channel (TDMA PON), higher speed multi-channel (TWDM PON), and higher speed point to point overlay PONs. Amendment 2 to Recommendation ITU-T G.9804.1 includes additional requirements for higher speed PON, including complementary for co-existence scenario of three generation PON systems.
- **ITU-T G.9804.2 (2021) Amd.2 “Higher speed passive optical networks - Common transmission convergence layer specification - Amendment 2” (under approval)** specifies the common transmission convergence (ComTC) layer of Higher Speed passive optical network (HSP) systems providing optical access for residential, business, mobile backhaul and other applications. This specification defines operation of HSP systems in a manner agnostic of transmission rates, number of operating wavelength channels, and signal modulation.

- [ITU-T G.9804.3 Amd.2 “50-Gigabit-capable passive optical networks \(50G-PON\): Physical media dependent \(PMD\) layer specification - Amendment 2”](#) describes a 50-Gigabit-capable passive optical network (50G PON) system in an optical access network for residential, business, mobile backhaul and other applications. This system operates over a point-to-multipoint optical access infrastructure at the nominal line rate of 50 Gbit/s in the downstream direction. Amendment 2 defines the optical interface parameters of 50 Gbit/s upstream direction on further power budget classes besides N1 class.
- [ITU-T G.9806 Amd.3 “Higher-speed bidirectional, single fibre, point-to-point optical access system \(HS-PtP\) - Amendment 3”](#) describes a higher speed bidirectional single fibre point-to-point optical access system than the data rate in existing ITU-T point-to-point access systems. It supports 10 Gbit/s for the optical access services including the optical distribution network (ODN) specification, the physical layer specification, services requirements and the operation, administration and maintenance (OAM) specification. Amendment 1 added support for 25 Gbit/s. Amendment 2 added support for 50 Gbit/s. Amendment 3 adds support for 100 Gbit/s, Optical Path Loss budget Classes SL (0-10 dB), SU (5-15 dB) and BL (10-20 dB).
- [ITU-T G.9930 “Point to point fibre-in-the-premises”](#) belongs to the family of ITU-T Recommendations addressing Fibre-in-the-Premises. This Recommendation specifically addresses the network topology consisting of multiple point-to-point fibres between a Residential Gateway (RG) and Customer Premises Equipment (CPE), e.g., Wireless Access Points (WAP). This Recommendation G.p2pf specifies the system architecture and requirements for high-speed point-to-point-fibre-based in-premises transceivers.
- [ITU-T G.9940 “High speed fibre-based in-premises transceivers - system architecture”](#) belongs to the family of ITU-T G.fin Recommendations. Recommendation G.fin-SA specifies the system architecture and requirements for high speed fibre-based in-premises transceivers.
- [ITU-T G.9941 “High speed fibre-based in-premises transceivers - physical layer specification”](#) belongs to the family of ITU-T G.fin Recommendations. Recommendation G.fin-PHY specifies the physical layer of high speed fibre-based in-premises (G.fin) transceivers for applications in home and SME.
- [ITU-T G.9942 “High speed fibre-based in-premises transceivers - data link layer”](#) belongs to the family of ITU-T G.fin Recommendations. Recommendation G.9942 specifies the data link layer for high-speed fibre-based in-premises transceivers.
- [ITU-T G.9960 Amd.1 “Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification - Amendment 1”](#) belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9960 specifies the system architecture and physical (PHY) layer for wireline-based home networking transceivers which are capable of operating over premises' wiring, including inside telephone wiring, coaxial cable, and power-line wiring. Amendment 1 to G.9960 (2023) adds the new feature HBMSG/HBACK.

- **ITU-T G.9960 (2023) Amd.2 “Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification - Amendment 2” (under approval)** belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9960 specifies the system architecture and physical (PHY) layer for wireline-based home networking transceivers which are capable of operating over premises' wiring, including inside telephone wiring, coaxial cable, and power-line wiring.
- [ITU-T G.9961 \(revised\) “Unified high-speed wireline-based home networking transceivers - Data link layer specification”](#) belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9961 specifies the data link layer (DLL) for wireline-based home networking transceivers capable of operating over premises wiring including inside telephone wiring, coaxial cable, and power-line wiring. It complements the system architecture and physical (PHY) layer specification in Recommendation ITU-T G.9960, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964.
- [ITU-T G.9961 Amd.1 “Unified high-speed wireline-based home networking transceivers - Data link layer specification - Amendment 1”](#) belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9961 specifies the data link layer (DLL) for wireline-based home networking transceivers capable of operating over premises wiring including inside telephone wiring, coaxial cable, and power-line wiring.
- [ITU-T G.9964 \(revised\) “Unified high-speed wireline-based home networking transceivers - Power spectral density specification”](#) specifies the control parameters that determine spectral content, power spectral density (PSD) mask requirements, a set of tools to support reduction of the transmit PSD, means to measure this PSD for transmission over telephone wiring, power line wiring and coaxial cable, as well as the allowable total transmit power into a specified termination impedance.
- [ITU-T G.Suppl.40 \(revised\) “Optical fibre and cable Recommendations and standards guideline”](#) provides information on the background and specifications used in the development of optical fibre and cable ITU-T Recommendations such as Recommendations ITU-T G.651.1 G.652, G.653, G.654, G.655, G.656 G.657 and L-series Recommendations. It also contains information used in the development of test method Recommendations such as Recommendations ITU-T G.650.1, G.650.2 and G.650.3. Moreover, this Supplement maps ITU-T documents to optical fibre and cable standards developed under IEC. Fifth edition covers new technical report on “Optical fibre, cable, and components for space division multiplexing” and L-series Recommendations for optical fibre cable.
- [ITU-T G.Suppl.41 \(revised\) “Design guidelines for optical fibre submarine cable systems”](#) describes design considerations for repeatered, repeaterless and optically amplified systems supporting synchronous digital hierarchy (SDH) and optical transport network (OTN) signals in optical submarine cable systems.

- [ITU-T G.Suppl.55 \(revised\) “Radio-over-fibre \(RoF\) technologies and their applications”](#) includes new important fundamental technologies, which are unique and useful techniques for radio-over-fibre (RoF) systems.
- [ITU-T G.Suppl.58 \(revised\) “Optical transport network module framer interfaces”](#) describes several interoperable component-to-component interfaces (across different vendors) to connect an optical module (with or without digital signal processor) to a framer device in a vendor's equipment supporting 25G, 40G, 50G, 100G or beyond 100G optical transport network (OTN) interfaces. Only the structure of the 11G, 28G, 56G, or 112G physical lanes of the different OTN module framer interface examples is provided in this Supplement. Electrical parameters for these interfaces can use specifications provided in the relevant clauses of Optical Internetworking Forum common electrical input/output (OIF-CEI) implementation agreement (IA) specifications. For their electrical characteristics, the OIF-CEI IA specifications can be used. This Supplement relates to Recommendation ITU-T G.709/Y.1331.
- [ITU-T G.Suppl.68 \(revised\) “Synchronization OAM requirements”](#) provides an overview of synchronization operations, administration and maintenance (OAM) and includes fault management, performance monitoring, alarms and events.
- [ITU-T G.Suppl.71 \(revised\) “Optical line termination capabilities for supporting cooperative dynamic bandwidth assignment”](#) describes the passive optical network optical line termination or PON OLT capabilities needed for applying cooperative dynamic bandwidth assignment (CO DBA) both in a generic sense and for specific use cases. It explains the interactions of the optical line termination (OLT) with the external entity sending information for CO DBA, the way to interpret such information, and the needs for coordination on choosing values for configurable parameters.
- [ITU-T G.Suppl.79 “Latency control and deterministic capability over a PON system”](#) describes the latency control and deterministic capability of PON systems. It reviews feasible technologies of latency control and optimization technologies over a PON, and discusses possible future expansion on PON system including use case and requirements, technologies for latency control and deterministic improvement, and possible extensions in future.
- [ITU-T G.Suppl.80 “Use case & Requirements of Fibre-based In-premises networking for Home Application \(FIP4H\)”](#) describes the use cases, requirements, and corresponding advantages of fibre-based in-premises networking technology (G.fin) for the home application.
- [ITU-T G.Suppl.81 “Practical aspects of PON security”](#) gives an overview of PON security, collects the use cases on PON security with associated expectations, and reviews security aspects and methods applicable to PON systems, including the general PON Threat Model, Unicast data encryption key exchange, Duplicate-ONU-SN, Security Enhancement Recommendations in OMCI-based authentication, which may be considered in future PON recommendations to support security enhancement features.

- [ITU-T G.Suppl.82 “Enhanced optical line termination with IT functions”](#) describes the enhanced Optical Line Terminals (eOLT) with IT capabilities such as computation and storage. It describes the application scenarios and use cases, together with the eOLT architectures. Requirements for capabilities, services and system of the eOLT are also illustrated in this supplement.
- [ITU-T G.Suppl.83 “Supplement on the use of options in PTP profile with full timing Support from the network”](#) provides clarifications and guidelines on the use of options in PTP profile with full timing support from the network.
- [ITU-T H.273 \(V4\) \(revised\) “Coding-independent code points for video signal type identification”](#) defines various code points and fields that establish properties of a video (or still image) representation and are independent of the compression encoding and bit rate. These properties may describe the appropriate interpretation of decoded data or may, similarly, describe the characteristics of such a signal before the signals are compressed by an encoder that is suitable for compressing such an input signal. This edition of ITU-T H.273 removes an informative reference that had been included in the not-yet-published third edition of Rec. ITU-T H.273, due to a publication delay of the referenced document (a video format specification under development in SMPTE). It also includes some minor corrections and clarifications. The text was developed as a twin text Recommendation corresponding to the video code points in ISO/IEC 23091-2 (formerly ISO/IEC 23001-8) in collaboration with ISO/IEC JTC 1/SC 29. It is published as a technically aligned twin text by both organizations (ITU-T and ISO/IEC).
- [ITU-T H.274 \(V3\) \(revised\) “Versatile supplemental enhancement information messages for coded video bitstreams”](#) specifies the syntax and semantics of video usability information (VUI) parameters and supplemental enhancement information (SEI) messages for use with coded video bitstreams. The VUI parameters and SEI messages defined in this Recommendation may be conveyed within coded video bitstreams in a manner specified in a video coding specification or may be conveyed by other means as determined by the specifications for systems that make use of such coded video bitstreams. This Recommendation is particularly intended for use with coded video bitstreams as specified by Rec. ITU-T H.266 | ISO/IEC 23090-3, although it is drafted in a manner intended to be sufficiently versatile and generic that it may also be used with other types of coded video bitstreams.
- [ITU-T H.430.3 \(V2\) \(revised\) “Service scenario of immersive live experience \(ILE\)”](#) identifies service scenarios by analysing several use cases on immersive live experience (ILE) services, in order to classify ILE services and to clarify a reference model of ILE. The new edition of Recommendation H.430.3 appended service scenarios and use cases of interactive immersive services (IIS) as the part of ILE. This Recommendation also summarises several use cases and identifies candidate technologies for implementing ILE, including standards gap analysis related to ILE technologies.

- [ITU-T H.430.6 “Media transport protocols, signalling information of haptic transmission for immersive live experience \(ILE\) systems”](#): ILE systems may handle haptic information, such as vibrotactile and kinaesthetic actions, for increasing more immersiveness in addition to audio and video. Haptic information should be transmitted synchronously with audio, video and lighting information. This draft Recommendation identifies media transport protocol and signalling information of haptic transmission for immersive live experience (ILE) systems, in order to transmit haptic information synchronously for provide ILE services.
- [ITU-T H.430.7 “Requirements of interactive immersive services”](#) provides the definition and requirements of interactive immersive services (IIS). Based on the overview of IIS, the requirements which include interactive capabilities, synchronous transmission of concurrent streams, intelligent distribution of massive multimedia data, media processing for immersive interactive information, and network status awareness with QoE scheduling, are specified in this Recommendation.
- [ITU-T H.430.8 “Functional architecture of interactive immersive services \(IIS\) systems”](#) identifies the high-level architecture, functions, and reference points of interactive immersive services (IIS) system.
- [ITU-T H.431.1 “Functional architecture for cloud virtual reality systems”](#) is as the subsequent Recommendation of ITU-T F.746.14, specifies the functional architecture of cloud virtual reality systems. It describes the overall functional architecture including control layer, resource layer, network layer, terminal layer, OA&M and security. This Recommendation also describes the basic functions of each layer, such as by unified scheduling/technology integration/content distribution of the control layer, cloud-based operation on the resource layer and high-quality transmission by the network layer, the cloud VR content can be run concurrently based on the cloud and is distributed to the terminal for presentation.
- [ITU-T H.626.6 “Architecture for big data application in video surveillance systems”](#): As the amount of video data is growing in the video surveillance systems, the suitable architecture is needed to support the requirements for big data application in video surveillance systems to deal with the structured and unstructured data, and to enhance the efficiency for the huge data retrieval and the data mining across time and space range. This Recommendation is to define an architecture for big data application in video surveillance systems, including the functional architecture and reference points. This Recommendation is based on Recommendation ITU-T F.743.7 "Requirements for big data-enhanced visual surveillance services".
- [ITU-T H.644.6 “Architecture for video distribution systems”](#) specifies the architecture for video distribution systems. The video distribution system described in this Recommendation is an over-the-top video application system, which has the capabilities of video access, distribution, transcoding, processing,

management, and presentation, and can provide the live video streaming service, video on demand service, and other related value-added services to users on the Internet. Users can directly use the video distribution functions through the system without complex system development, deployment and maintenance processes.

- [ITU-T H.644.7 “Functional architecture for media processing services”](#) specifies the functional architecture for the media processing services. In particular, the scope of this Recommendation includes domains and functional roles relationship, functional architecture and reference points. Media processing services utilize a set of techniques including cloud computing, computing resource virtualization, and job queue processing to dynamically control and manage all kinds of computing resources, which improves scalability, flexibility, and availability.
- [ITU-T H.644.8 “Requirements and architecture on audio and video processing of media processing services”](#): With the requirements of recently developed video services, media contents are required to be processed before transmission through CDN. For example, media contents are required to be transcoded adaptively according to quality of network. Some UGC contents are required to not include specific contents. Some image and text contents are required to be detected, located and identified to provide personalized service for consumers. Media processing service is based on the concept of cloud computing technology. Media processing service provides a cost-effective, easy-to-use, elastic, on-demand and highly scalable method to process audio and video in various services related with video. This Recommendation identifies requirements and architecture on audio and video processing via management platform for the media processing service.
- [ITU-T H.552 “Implementation of vehicular multimedia systems”](#) specifies essential requirements for the implementation of vehicular multimedia systems (VMSs), addressing four of their main aspects: connectivity, providing essential standard references and specific performance requirements for the vehicular environment, human machine interface, dealing with voice assistant (VA) and auditory interaction requirements, media format and control, providing standard references for different types of media for VMSs, smartphone infotainment assistant, with requirements related to the interface architecture between smartphones and VMSs, as well as performance requirements to provide a fair level of user experience. Two appendices provide VMS implementation guidance: radio frequency performance criteria for wireless local area network (WLAN) and user performance testing scenarios for WLAN and wireless personal area network connectivity, implementation of a diagnostic interface for tuning the VA functionalities.
- [ITU-T H.862.6 “Functional requirements for counselling services based on artificial emotional intelligence”](#) proposes service requirements and functional specifications for counselling services based on artificial emotional intelligence technologies. This Recommendation proposes a service model in counselling services using several scenarios. At a time when artificial intelligence (AI) technologies are widely proposed and used, the relevant standards can be an

important opportunity to facilitate the development of the technology in the industry.

- [ITU-T J.1 \(revised\) “Terms, definitions and acronyms for television and sound transmission and integrated broadband cable networks”](#) compiles all the definitions related to television and sound transmission, and integrated broadband cable networks, and which are in force in J-series and N-series Recommendations developed under the responsibility of SG9. The Recommendation is regularly updated to reflect newly-approved terms and definitions.
- [ITU-T J.153 “System architecture for cable television services to use IMT-2020 radio system”](#): In this Recommendation, four functional components of adaptive MBS are described and the system architecture is defined to meet the four system requirements specified in ITU-T Recommendation ITU-T J.152, namely Efficiency, Reliability, Robustness, and Latency.
- [ITU-T J.198.2 “Physical layer specification for third-generation HiNoC”](#) aims to define the physical (PHY) layer specification of third generation high performance network over coax (HiNoC 3.0) which provides 10 Gbit/s data transmission over coaxial networks in the cable industry. The HiNoC network consists of a HiNoC bridge (HB) and HiNoC modems (HMs). The HiNoC protocol stack includes Media Access Control (MAC) layer and Physical (PHY) layer. This Recommendation contains descriptions for the signal transmission mechanism of the HiNoC 3.0 PHY layer, including frame structure, channel coding and modulation techniques. The HiNoC 3.0 protocol supports channel bonding which refers to the scheduling of the MAC layer frames over multiple PHY layer channels.
- [ITU-T J.198.3 “MAC layer specification for third-generation HiNoC”](#) aims to define the MAC layer specification of third generation high performance network over coax (HiNoC 3.0) which provides 10 Gbit/s data transmission over coaxial networks in the cable industry. HiNoC consists of HiNoC Bridge (HB) and HiNoC Modem (HM) in terms of architectural functional entity and is layered as Media Access Control (MAC) layer and Physical (PHY) layer.
- [ITU-T J.298 \(revised\) “Requirements and technical specifications of a cable TV hybrid set-top box compatible with terrestrial and satellite TV transport”](#) describes the requirements and technical specifications of a cable TV hybrid set-top box compatible with terrestrial and satellite TV transport. The main purpose of the Recommendation is to specify minimum and basic requirements for a hybrid set-top box (STB), which meets the requirements of all countries and regions.
- [ITU-T J.484 “Requirements of multicast adaptive bitrate \(M-ABR\) IP delivery”](#) defines the requirements of an IP delivery technology which makes use of multicast to reduce audio-visual traffic in the cable delivery network but uses HTTP based unicast inside the home network, thereby making it compatible with consumer devices such as smartphones.
- [ITU-T J.1291 “Requirements and functional specification of Audio and Video interface on cable set-top box”](#) specifies requirements and function of audio and video interface on cable set-top box.

- [ITU-T J.1311 “Technical Requirements for Cloud Gaming Service Platforms”](#) describes the cloud gaming service platform basic components and functional elements requirements including resource layer, capability layer, business layer and client access layer. This Recommendation is intended to provide a reference for game service developers and operators to build and operate a cloud gaming service.
- [ITU-T J.1630 “End to End network characteristics requirement for video services over integrated broadband cable network”](#) describes the scope of key performance indicators (KPIs) for network performance and key quality indicators (KQIs) for user experience with traditional and advanced video services. This Recommendation also defines the measurement and monitoring methods. Such key performance indicators (KPI) as well as their monitoring and management can be used for multi-QoS optimization thus enabling AI functions over integrated broadband cable network. This Recommendation belongs to the series of Artificial Intelligence (AI) assisted cable network Recommendations intended to provide more flexible and effective usage of network resource by applying intellectual functions.
- [ITU-T J.Suppl.12 “Comparison between third-generation HiNoC and second-generation HiNoC”](#) indicated the main differences between the third-generation HiNoC (HiNoC 3.0) and the second-generation HiNoC (HiNoC 2.0). This supplement is helpful for operators to choose the proper HiNoC for deployment.
- [ITU-T J.Suppl.13 “Factual subscriber-base reporting and protected content delivery in Conditional Access System - Test Methods”](#): The purpose of this supplement is to frame the testing methodology against the various technical requirement of CAS. In addition to develop a framework for standardization (i.e. Technical Requirements), some countries have issued the provisions for assuring broadcasters and content providers that each CAS system has to conform to certain technical features and get tested from certified lab before deployment so that piracy and other malpractices can be minimised. The draft new supplement will provide the clause-by-clause test procedures and expected results for each clause of the draft new ITU-T Recommendation J.1036 such as log requirements, reports requirements, database requirements, security requirements, and more.
- [ITU-T L.100 \(revised\) “Optical fibre cables for duct and tunnel application ”](#) describes characteristics, construction, test methods and performance criteria of optical fibre cables installed by pulling method for duct and tunnel application.
- **ITU-T L.101 (revised) “Optical fibre cables for directly buried application” (under approval)** describes characteristics, construction and test methods of optical fibre cables for buried application. Note that Recommendation ITU-T L.43, Ed 2.0, was redesignated as ITU-T L.101, Ed 2.0, in February 2016. First, in order to demonstrate sufficient performance of an optical fibre cable, the characteristics that a cable should possess are described in this recommendation. Then, the methods of examining if whether a cable has the required characteristics are described in this recommendation. Therein, detailed performance criteria for a cable are recommended. Recommended technical requirements are detailed by

reference to IEC 60794-3-11 on outdoor optical fibre cables for duct, directly buried, and lashed aerial applications. Changes and additions to these requirements suitable to the directly buried cable application are recommended herein. Required conditions may differ from the installation environment. Therefore, instances where agreement on detailed conditions should be determined between customer and manufacturer are stated.

- **ITU-T L.103 (revised) “Optical fibre cables for indoor applications” (under approval)** describes characteristics, construction and test methods for optical fibre cables for indoor applications. In order for an optical fibre to perform appropriately, characteristics that a cable should have are described. Also, the method of determining whether the cable has the required characteristics is described. Required conditions may differ according to the installation environment; detailed test conditions need to be agreed upon between the user and manufacturer for the environment where a cable is to be used. Recommendation ITU-T L.103 describes characteristics, construction and test methods for optical fibre cables for indoor applications. In order for an optical fibre to perform appropriately, characteristics that a cable should have are described.
- [ITU-T L.109 \(revised\) “Construction of optical/metallic hybrid cables ”](#) describes cable construction and provides guidance for the use of optical/metallic hybrid cable, which contains both optical fibres and metallic wires for telecommunication and/or power feeding. Technical requirements may differ according to the installation environment.
- [ITU-T L.250 \(revised\) “Topologies for optical access network”](#) describes the optical access network to be used in the design and construction of fibre to the x (FTTx), centralized- radio access networks (C-RAN) for mobile communications, and other network services. It deals mainly with access network architectures and the upgrading or new deployment of optical fibre to optical access networks.
- [ITU-T L.312 \(revised\) “Optical fibre cable maintenance support, monitoring and testing system for optical fibre cable networks carrying high total optical power ”](#) describes the functional requirements for optical fibre cable maintenance systems for optical fibre cable carrying a high total optical power. It also considers safety procedures and guidelines for the maintenance of outside optical fibre plant carrying a high total optical power.
- [ITU-T L.Supp1.58 “National experiences for FTTx network architectures”](#) provides the national experiences on FTTx network architectures which could be used as references during the construction of FTTx networks.
- [ITU-T M.3042 “Framework of communication network health evaluation”](#) introduces the framework of communication network health evaluation, definition of communication network health index, evaluation objects, and the weighted value of index scoring method. This Recommendation also provides the communication network health evaluation process.
- [ITU-T M.3043 “Framework of intent driven telecommunication operation and management”](#) **(under approval)** provides the framework of intent driven

management in telecommunication network and services operation and management, including the function requirements and workflows. It also describes its relationship with artificial intelligence enhanced telecommunication operation and management (AITOM). This Recommendation aims to support autonomous operation and management in a way of intent driven close-loop mechanism for improving customer experience, operation efficiency, service quality assurance and other applications.

- [Amendment 1 “Additions and corrections based on telecommunication network large model” to ITU-T M.3080 “Framework of artificial intelligence enhanced telecom operation and management \(AITOM\)” \(under approval\)](#). This Recommendation provides a framework of artificial intelligence enhanced telecom operation and management (AITOM). It describes the functional framework of AITOM to support telecom operation management for efficiency improvement, quality assurance, cost management, and security assurance. It also describes artificial intelligence (AI) pipelines that combine some components to enable AI based applications. This Recommendation also describes the relationship of the functional framework of AITOM with smart operations, management and maintenance (SOMM) presented in Recommendation ITU-T M.3041. General requirements of security are also described.
- [ITU-T M.3110.1 “X-Interface for the management of shared network resources- Protocol neutral requirements”](#) specifies a set of requirements to enable cooperative management of the shared network resources across the X-interface between the Master Operator (MOP) and the Participating Operator(s) (POPs), and provides high-level use cases as well as function sets for exchanging shared management information across the X-interface for the management of shared network resources. The function sets across this interface include: business activation, operation management, fault handling, resource allocation management, and security management, and the interface is developed following the interface specification methodology from Recommendation [ITU-T M.3020], in a protocol neutral manner.
- [ITU-T M.3111.1 “X-interface between telecom operation system and internet e-commerce platform - Protocol neutral requirements”](#): With the trend of digital transformation, information and communications service providers (ICSP) have to expand their e-commerce ecology to improve customer experience and increase opportunities for ICSP to provide services to customers. This Recommendation provides the protocol neutral requirements for the X-interface between the telecom operation system (TOS) and the internet e-commerce platform (IEP), following the interface specification methodology from Recommendation [ITU-T M.3020].
- [ITU-T M.3164.1 “Interface for on-site generic telecommunication smart maintenance - Protocol neutral requirements”](#) provides the requirements phase of the interface specification for on-site generic telecommunication smart maintenance at a protocol-neutral level. It describes the position of the relevant

interface and specifies the high-level requirements for interface interaction, as well as the specification level use cases for each requirement.

- [ITU-T M.3164.2 “Interface for on-site generic telecommunication smart maintenance - Protocol neutral analysis”](#) provides the analysis specification of the interface for on-site generic telecommunication smart maintenance (TSM). It defines the interface operation interactions for on-site TSM, including the managed entities and their relationships for the TSM interface, the interactive control information exchanged through this interface, and detailed parameter definitions of each interface operation.
- [ITU-T M.3164.3 “Interface for on-site generic telecommunication smart maintenance - REST-based design” \(under approval\)](#) specifies the design phase of the interface specification for on-site generic telecommunication smart maintenance (TSM) at the protocol-specific level. It describes the interface specification guidelines using Representational State Transfer (REST) technology, and also defines the interactive control information exchanged through this TSM interface in YAML Ain't Markup Language (YAML) / JavaScript Object Notation (JSON) format.
- [ITU-T M.3166.1 “Interface for blockchain management system – Protocol neutral requirements” \(under approval\)](#) proposes the protocol-neutral requirements for the management interface between a blockchain management system and blockchain systems. It defines the interface's position and specifies management requirements across key functional areas, including configuration management, performance management, fault management, and log management. This Recommendation aims to standardize the design, development, and application of blockchain system management interfaces to ensure efficient operation, monitoring, and troubleshooting. Key features include querying and modifying configurations, creating and managing performance measurement jobs, handling alarms, and managing logs. This Recommendation also provides detailed use cases, definitions, and references to existing ITU-T Recommendations, ensuring alignment with broader telecommunications management standards. This series of Recommendations are intended to enhance the stability, transparency, and interoperability of blockchain systems in diverse applications.
- [ITU-T M.3167.1 “Interface for robot-based on-site smart patrol of telecommunication networks - Protocol neutral requirements”](#): With the continuous development of Internet of Things (IoT) technology, the application of intelligent maintenance robots (IMRs) in the field of telecommunication smart maintenance (TSM) is increasing. Recommendation ITU-T M.3164.1 provides the requirements for the interface between the IMR-based smart patrol system (IbSPS) and the telecommunication smart maintenance system (TSMS) at a protocol-neutral level. It describes the position of the relevant interface and specifies the high-level requirements for interface interaction, as well as the specification level use cases for each requirement.

- [ITU-T M.3370 “Telecommunication preventive maintenance task – Overview”](#): The traditional operation and maintenance are mainly based on passive response, lacks the ability to predict and prevent failures in advance. By introduction of preventive maintenance, possible degradation in service quality can be averted, and good user experience can be ensured. This Recommendation describes procedure of preventive maintenance task, requirements for preventive maintenance task and classification for entities of preventive maintenance task.
- [ITU-T M.3186 “Shared information and data model \(SID\) for network operation cost management”](#) provides the “Shared information and data model (SID) for network operation cost management”. It covers the following aspects: The overall framework of the SID for network operation cost management. The specific definition of information object classes and their attributes in the SID for network operation cost management. Definition and description of related properties and relationships between information object classes.
- [ITU-T M.3351.1 “Framework of knowledge management for telecom operation and management”](#): The contents of this Recommendation include the following: Background and overview of knowledge management Knowledge classification in telecom operation and management Framework of knowledge management for telecom operation and management.
- [ITU-T M.3351.2 “Process of telecommunication operation and management knowledge graph construction” \(under approval\)](#): The complexity of telecommunication operation and management for network and service is increasing significantly due to evolving network architectures and service demands. To address this, knowledge graphs offer a structured approach to modelling domain knowledge and support intelligent application in telecommunication operation and management, such as fault diagnosis, service optimization, and network planning. The constructed telecommunication operation and management knowledge graph describes various concepts and their relationships in telecommunication scenarios. It forms a semantic graph that systematizes and interconnects knowledge in the field of telecommunication operation and management. It is required to outline process and detailed steps for building telecommunication operation and management knowledge graph to guide its construction in telecommunication operation and management scenarios. This Recommendation provides principles, process and typical use cases for the construction of telecommunication operation and management knowledge graph.
- [Amendment 1 “Extended requirements based on machine vision” \(under approval\) to ITU-T M.3364 “Requirements for on-site telecommunication smart maintenance management function”](#): Recommendation ITU-T M.3364 introduces requirements for on-site telecommunication smart maintenance management function. In this Recommendation, the requirements for telecommunication smart maintenance function are provided, which include on-site patrol, on-site overhaul, on-site troubleshooting, evaluation of maintenance work, management of maintenance knowledge base, management of service activation function, management of network resource, and management of smart maintenance

assistant toolkit (SMAT). This Recommendation also provides use cases of SMAT in telecommunication smart maintenance system (TSMS).

- [ITU-T M.3368 “Requirements for Optical Distribution Frame \(ODF\) on-site smart maintenance”](#) specifies the optical distribution frame (ODF) on-site smart maintenance architecture and functional requirements of ODF smart maintenance, including the functional requirements of smart handover unit (SHU), ODF smart maintenance system (OSMS) and the interface between SHU and OSMS. It reduces the ODF on-site maintenance workload of manual operation and maintenance mode and saves a lot of maintenance economic and time cost. The quickly and accurately changing optical fiber connections and then flexibly changing the network connection and data relationship according to the business requirements can be achieved. Consequently, the capability of smart maintenance and smart service for optical communication network and data center can be improved.
- [ITU-T M.3369 “Cost-effectiveness evaluation framework for network operation”](#) establishes the cost-effectiveness evaluation framework for network operation based on the classification of network operation cost which is defined in Recommendation ITU-T M.3386. It specifies cost-effectiveness evaluation indicators, methods, and processes for network operation cost evaluation within the framework.
- [ITU-T M.3374 “Requirements for computing power network management” \(under development\)](#) specifies the requirements for computing power network (CPN) management, including the function sets and the functional requirements. The functional requirements involve configuration management, fault management and performance management.
- [ITU-T M.3388 “Effectiveness indicators of intelligence level for AI enhanced telecom operation and management”](#): The effectiveness indicators for AI enhanced telecom operation and management aim to evaluate intelligence level with quantitative methods and focus on showing effects and benefits of applying AI in terms of operation optimization, cost reduction, service fulfilment, customer experience upgrade, etc. Recommendation ITU-T M.3388 provides the principle, classification, definition and method of effectiveness indicators to evaluate intelligence level of AI enhanced telecom operation and management.
- [ITU-T M.3389 “Requirements for artificial intelligence-based customer experience management of telecom services”](#): Recommendation M.3389 provides the requirements for artificial intelligence-based customer experience management of telecom services, key implementation processes, typical application scenarios and a use case. The goal is to explain the use of AI technology to achieve closed-loop management of customer experience evaluation, analysis, guarantee and optimization. This Recommendation considers the application of AI technology in customer experience quality monitoring, analysis and optimization strategy generation.

- [ITU-T M.3390 “Requirements for smart comprehensive analysis within artificial intelligence enhanced telecom operation and management \(AITOM\)”](#): This Recommendation proposes the requirements for smart comprehensive analysis within artificial intelligence enhanced telecom operation and management (AITOM), which includes network resource assurance analysis, network service quality analysis, End-to-End (E2E) service quality analysis, strategy generation of service quality assurance and other requirements. The goal of the Recommendation is to specify the requirements of using AI technology to achieve smart comprehensive analysis, focusing on service quality assurance, from the operation support system (OSS) level.
- [ITU-T M.3391 “Requirements for smart maintenance of telecommunications infrastructure based on unmanned aerial vehicles”](#): Recommendation M.3391 specifies the requirements for smart maintenance of telecommunications infrastructure based on unmanned aerial vehicles (UAVs), which includes the requirements for UAV-based smart patrol system, patrol objects and contents, and related interface requirements. The goal of the Recommendation is to specify the requirements for using UAV-based smart patrol technology in the maintenance of outdoor telecommunications infrastructure.
- [ITU-T M.3392 “Requirements for telecommunication service design within smart operation, management and maintenance \(SOMM\)”](#): With the network technology evolving, network as a service (NaaS) has emerged for organizations to consume network infrastructure and how to do efficient, flexible and automatic telecommunication service design (TSD) has to be taken into account. This Recommendation provides the requirements for TSD within smart operation, management and maintenance (SOMM), which encompasses object design, operation activity design and verification.
- [ITU-T M.3393 “Requirements for smart maintenance of cell antenna” \(under development\)](#) describes the requirements for smart maintenance of cell antenna. The requirements include framework, functional requirements and related interfaces, which are addressed to use AI technology to process the big data from network side and calculate the predicted antenna position and azimuth angle, and then provide correction proposals.
- [ITU-T M.3411 “User identity and access management requirements for telecommunications management network”](#) specifies the user identity and access management requirements for telecommunications management network (TMN). It mainly consists of the architecture and the functional requirements for identity and access management (IAM) in TMN, which include identity management functions and access management functions. This Recommendation applies to the guidance of design and development of IAM solutions for TMN.
- [ITU-T P.10/G.100 \(2017\) Amd.2 “Vocabulary for performance, quality of service and quality of experience. Amendment 2 New definitions for inclusion in Recommendation ITU-T P.10/G.100”](#) contains terms and definitions associated

with network performance, quality of service and quality of experience. Amendment 2 introduces new definitions and a bibliographic reference.

- [ITU-T Q.763 \(1999\) Amd.7 “Signalling System No. 7 - ISDN User Part formats and codes. Amendment 7. Extensions for the support for the calling line identification authentication”](#) was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in ITU-T Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q.763 (1999) in order to accommodate these needs. This amendment should be read in connection with the related amendments to Recommendations ITU-T Q.761 and ITU-T Q.762.
- [ITU-T P.812 “Principles of subjective test methods for interactive virtual reality \(VR\) applications”](#) provides methods and procedures for conducting subjective evaluation experiments for interactive virtual reality (VR) applications. Such interactive VR applications enable the user to interact with generated videos, images, sounds, and other sensations that aim at but are not limited to, the simulation of a user's physical presence in this virtual environment with the use of specialized VR equipment.
- [ITU-T P.833.2 “Methodology for the derivation of equipment impairment factors from subjective listening only tests for fullband speech codecs”](#) describes an extension of the methodology for deriving equipment impairment factors from subjective listening-only tests. It is intended that it primarily be applied to determining fullband equipment impairment factors le,FB, capturing the degradation introduced by fullband speech codecs.
- [ITU-T P.863.2 \(revised\) “Extension of ITU-T P.863 for multi-dimensional assessment of degradations in telephony speech signals up to fullband”](#) describes a set of models for predicting perceptual dimensions of degradations linked to the overall speech quality from narrowband (300 to 3 400 Hz) to fullband (20 to 20 000 Hz) telecommunication scenarios. The predictions target user judgements on four perceptual dimensions, as obtained in a subjective test described in an annex.
- [ITU-T P.910 \(revised\) “Subjective video quality assessment methods for multimedia applications”](#) describes non-interactive subjective assessment methods for evaluating the one-way overall video quality, audio quality and audiovisual quality for applications such as multimedia and distribution quality television. These methods can be used for several different purposes including, but not limited to, comparing the quality of multiple devices, comparing the performance of a device in multiple environments, and for subjective assessment where the quality impact of the device and the audiovisual material is confounded.
- [ITU-T P.1204 \(revised\) “Video quality assessment of streaming services over reliable transport for resolutions up to 4K”](#) is the introductory document for a set of documents that describe model algorithms for monitoring the video quality for streaming using reliable transport (e.g., adaptive streaming based on the hypertext transfer protocol (HTTP) over the transmission control protocol (TCP), quick user

datagram protocol internet connections (QUIC)). mobile streaming on handheld devices such as smartphones; –presentation on tablet-type devices.

- [ITU-T P.1204.5 \(revised\) “Video quality assessment of streaming services over reliable transport for resolutions up to 4K with access to transport and received pixel information”](#) describes the hybrid no-reference video quality estimation model for monitoring the video quality for streaming using reliable transport (e.g., hypertext transfer protocol- (HTTP-)based adaptive streaming (HAS) over the transmission control protocol (TCP), quick user datagram protocol internet connections (QUIC)).
- [ITU-T P.1211 “Derivation procedure of contribution values for quality degradation of adaptive audiovisual streaming services”](#) provides the derivation procedure of contribution values that provides information about a relationship between quality-influencing factors (e.g., media quality levels and stalling) and the final media session quality score of adaptive audiovisual streaming services.
- [ITU-T P.Suppl.30 “Considerations on the automation of Digital Financial Services testing”](#) provides examples of automation which are suitable for DFS testing. It is meant to be a starting point and basis for industry vendors and other stakeholders in the DFS Ecosystem to develop robust environments for automated testing. In all cases, it is assumed that automation is technology neutral and technology agnostic.
- [ITU-T Q.931 \(1998\) Amd.2 “ISDN user-network interface layer 3 specification for basic call control. Amendment 2. Extensions for the support for the calling line identification authentication”](#) was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q. 931 (1998) in order to accommodate these needs.
- [ITU-T Q.1902.3 \(2001\) Amd.6 “Bearer Independent Call Control protocol \(Capability Set 2\) and Signalling System No. 7 ISDN user part: Formats and codes. Amendment 6. Extensions for the support for the calling line identification authentication”](#) was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q.1902.3 (2001) in order to accommodate these needs. This amendment should be read in connection with the related amendments to Recommendations ITU-T Q.1902.1 and ITU-T Q.1902.2.
- [ITU-T Q.3064 “Signalling architecture of NICE \(Network intelligence capability enhancement\) in support of awareness capabilities”](#) provides the signalling architecture of NICE in support of awareness capabilities based on Recommendation ITU-T Y.2301, ITU-T Y.2302 and ITU-T Y.2303. Based on the functional architecture and the awareness functions of NICE, this recommendation specifies the mapping of reference points to interfaces in the signalling architecture of NICE especially in support of awareness capabilities. And

it also provides the signalling requirements and protocols used for interfaces and the signalling procedures of NICE in support of awareness capabilities.

- [ITU-T Q.3648 “Signalling architecture of data channel enhanced IMS network”](#): In the context of signalling architecture of Recommendation ITU-T Q.3648, the data channel enhanced IMS network framework, signalling architecture, interfaces are standardized to enable the data channel capability and realize the IMS network interactive services.
- [ITU-T Q.3742 “Signalling requirements and data models for SD-DCI service”](#): As the enterprises use more and more geographically distributed cloud services, the demand for interconnection among different data centers is increasing. Network operators develop Software-Defined Data Center Interconnection (SD-DCI) services to meet customized demands for interconnection among multiple data centers. The Recommendation ITU-T Q.3742 specifies the signalling requirements and data models for SD-DCI service.
- [ITU-T Q.3962 “Requirements and Reference Model for optimized traceroute of joint Internet Protocol/Multi-Protocol Label Switching”](#) aims to solve the problems of wrong failure location and performance information which brought by the traditional isolated traceroute tools in joint Internet Protocol /Multi-Protocol Label Switching (IP/MPLS) scenario. This Recommendation describes the requirements and reference model for optimized traceroute for joint IP/MPLS.
- [ITU-T Q.4045 “Framework of network function virtualization automated testing”](#) provides overview and framework requirements of Network Function Virtualization (NFV) automated testing. To introduce NFV automated testing framework, this Recommendation also provides an overview of NFV automated testing and design consideration of it. Then, framework and requirements for NFV automated testing are derived based on the use cases.
- [ITU-T Q.4046 “Interoperability testing requirements of blockchain as a service”](#) aims to provide blockchain as a service (BaaS) interoperability testing overview and specifies BaaS interoperability testing requirements which are derived from use cases.
- [ITU-T Q.4047 “Interoperability testing between software-defined networking \(SDN\) and hypervisor based computing virtualization”](#) specifies the interoperability testing between software-defined networking (SDN) and hypervisor based computing virtualization. Firstly, this Recommendation introduces the framework for interoperability between SDN and hypervisor based computing virtualization, which includes the target areas, components and interoperability in different scenarios. The corresponding requirements and the data model framework which should be considered during the interoperability testing between SDN and hypervisor based computing virtualization are presented in the next. And test cases of interoperability testing between SDN and hypervisor based computing virtualization are provided as appendix, which describe the involved test procedures.

- [ITU-T Q.4071 “The testing of 3D ultra high density IoT networks”](#): High density and ultra-high density communication networks are currently being introduced based on the density requirements for IoT devices. For 3D Ultra-high density networks, the density of IoT devices is 100 devices per cubic meter. Such networks have certain design peculiarities and different fractal figures can be used for their planning. Therefore, it is required to develop models and test methods for high density and ultra-high density networks. New models and test methods for three-dimensional ultra-high density IoT networks will be developed and the structure of a model network for testing will be presented in the proposed Recommendation.
- [ITU-T Q.4072 “Monitoring Parameters for Intelligent Speech in Future Networks”](#): Intelligent speech technologies can greatly improve the efficiency of network operation and maintenance when it is applied to the future network. Meanwhile, it is required to be monitored periodically. This Recommendation aims to specify monitoring parameters of intelligent speech applied in future networks. The monitoring parameters are classified into speech recognition parameters, speech generation parameters, natural language processing parameters, system parameters, and performance parameters.
- [ITU-T Q.4073 “Framework for interconnection testing of Voice, Video over 5G”](#) specifies the high-level framework for the interconnection of Voice over New Radio (VoNR) based networks to achieve worldwide interoperability with legacy and IMS/MMTel networks.
- [ITU-T Q.4074 “Testing of robotics based on a model network”](#): Currently, the services of remote control of robotics over the network are becoming increasingly widespread. One of the important tasks in the implementation of such services is comprehensive testing. This Recommendation presents the architecture and characteristics of a model network for testing a remote robotics control service over the network. The control of operations is carried out using a camera.
- [ITU-T Q.4075 “Test specifications for remote testing of Internet of Things using the probes”](#): The Internet of things (IoT) is one of the global infrastructures for the information society, delivering advanced services by interconnecting things based on, existing and evolving, interoperable information and communication technologies. Currently, methods of remote testing of network equipment are actively used. During testing, special attention is paid to the quality of service parameters (delays, losses, jitter, bandwidth and etc.), however, in relation to the specifics of the IoT devices, it is most appropriate to control the parameters for the optimum functioning of end devices. IoT devices, as a example, have battery power and monitoring of their operation parameters will allow timely adjustments to the algorithms of their functioning in order to extend the battery life. The use of probes will allow addressing important parameters of the IoT devices and conduct remote testing of various parameters of the Internet of Things devices, such as: power consumption, memory and processor operation, open interfaces, etc. The description of the test specifications for remote testing using probes will allow us to develop a unified approach for conducting appropriate testing of IoT devices.

- [ITU-T Q.4102 \(2022\) Amd. 1 “Hybrid peer-to-peer communications: Peer protocol”](#) enhances the peer protocol to support various services over hybrid peer-to-peer networks. The updates include a new message format, revised message configurations, and a new feature for establishing vertical candidate paths.
- [ITU-T Q.4103 \(2022\) Amd. 1 “Hybrid peer-to-peer communications: Overlay management protocol”](#) enhances overlay management protocol to support various services over hybrid peer-to-peer networks. The updates include revised resource elements, and revised message configuration.
- [ITU-T Q.4104 “Hybrid peer-to-peer \(P2P\) communications: Signalling requirements for data streaming service”](#) describes the signalling requirements for data streaming service over hybrid peer-to-peer network. The hybrid overlay network may have multiple data sources which send the different types of data. Thus, source peers and peers conduct the several specific operations for data streaming over the hybrid peer-to-peer communications, and those operations define the requirements for the relevant protocols such as overlay management protocol and peer protocol. This Recommendation includes service architecture for data streaming services over hybrid peer-to-peer network, high-level procedures and signalling requirements for the relevant protocol.
- [ITU-T Q.4105 “Hybrid peer-to-peer \(P2P\) communications: Signalling requirements for feature-based video services”](#) specifies the signalling requirements for the feature-based video services that exchange feature about the video scene rather than transmitting fully encoded video data, through the hybrid overlay network specified in [ITU-T Q.4100]. The feature is used for reconstruct the video in the end point using artificial intelligence, such as generative AI. This Recommendation specifies signalling requirements for developing further protocol specifications for feature-based video services over hybrid overlay networks, such as video streaming, virtual conference, metaverse, etc.
- [ITU-T Q.4141 “Requirements and signalling of intelligence control for the border network gateway in computing power network”](#) provides a network solution to dynamically and flexibly schedule computing tasks at the border network gateway based on real-time computing resource performance, network performance, cost and other multi-dimensional factors based on business needs, thereby improving resource utilization, network utilization efficiency, and improving business user experience. This Recommendation aims to study the requirements and signalling of intelligence control for the border network gateway in computing power network.
- [ITU-T Q.4142 “Signalling architecture for service orchestration in computing power network”](#) provides the signalling architecture for service orchestration in computing power network (CPN) based on Recommendation ITU-T Y.2501, ITU-T Y.2502 and ITU-T Q.4140. This Recommendation provides overall signalling architecture, functional entities and interfaces for service orchestration, and signalling procedures of computing resource collection, service orchestration within one operator, sharable service publishing among multiple operators, and cross-operator service orchestration.

- [ITU-T Q.4143 “Signalling requirements for cloud-based control plane and pooled user plane of vBNG \(virtualized Broadband Network Gateway\)”](#) aims to specify the signalling requirements for cloud-based control plane and pooled user plane of vBNG (virtualized Broadband Network Gateway). Firstly, as a basic background, this Recommendation introduces the centralized deployment requirements and architecture of CCP (cloud-based control plane) and PUP (pooled user plane) of vBNG. Based on the service procedure of vBNG, the signalling requirements for CCP and PUP of vBNG will be introduced.
- [ITU-T Q.4160 “Quantum key distribution networks - Protocol framework”](#) specifies a framework for signalling and protocols for quantum key distribution network (QKDN).
- [ITU-T Q.4161 “Protocols for Ak interface for quantum key distribution network”](#) specifies protocols for Ak interface in quantum key distribution network (QKDN).
- [ITU-T Q.4162 “Protocols for Kq-1 interface for quantum key distribution network”](#) specifies protocols for Kq-1 interface in quantum key distribution network (QKDN).
- [ITU-T Q.4163 “Protocols for Kx interface for quantum key distribution network”](#) specifies protocols for Kx interface in quantum key distribution network (QKDN).
- [ITU-T Q.4164 “Protocols for Ck interface for quantum key distribution network”](#) specifies protocols for Ck interface in quantum key distribution network (QKDN).
- [ITU-T Q.5007 “Signalling architecture for microservices based intelligent edge computing”](#) specifies the signalling architecture, protocol interfaces, and protocol procedures for microservices based intelligent edge computing.
- [ITU-T Q.5008 “Signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond”](#) provides the signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond. These requirements include the signalling information over each reference points and service procedures for high-level AI Platform.
- [ITU-T Q.5009 “Signalling Requirements and Protocol procedures for two-way QoS mechanism between access networks and core networks in IMT-2020 network and beyond”](#) specifies the signalling requirements, signalling flows and message format for enhanced quality assured connections in IMT-2020 network and beyond.
- **ITU-T Q.5010 “Signalling requirements and architecture for urban air mobility service environment” (under approval):** An increasing number of companies, countries, and institutions are building consortiums or partnerships to create alliances and drives efforts to successfully commercialize UAM service. From the service providers’ perspective, an architecture and signalling points that can interconnect UAM service infrastructure and mobile communication network, are needed to be categorized into four different functional blocks to create connectivity between UAM aircraft and the commercial network.

- [ITU-T Q.5011 “Signalling requirements and interfaces of edge-aided energy management agent at intelligent edge computing”](#) defines the signalling requirements and interfaces of edge-aided energy management agent at intelligent edge computing. This Recommendation focuses on the signalling functionality of the edge-aided energy management agent (EEMA) and interfaces among EEMAs.
- [ITU-T Q.5012 “Signalling architecture of WLAN access network for interworking with 5G network”](#) describes the signalling architecture and signalling protocol procedures for WLAN access network to interwork with 5G network, focusing on the interworking procedures between Layer 2 and Layer 3 for providing enhanced end-to-end user experience.
- [ITU-T Q.5013 “Signalling Requirements and Protocol procedures for two-way QoS mechanism between access networks and core networks in IMT-2020 network and beyond”](#) specifies signalling requirements and protocol procedures for two-way QoS mechanism between access networks (AN) and core networks (CN) in IMT-2020 network and beyond. It includes signalling requirements, protocol procedures and message format for enhanced QoS negotiation mechanism between AN and CN.
- [ITU-T Q.5028 “Data management interfaces for intelligent edge computing-based smart agriculture service”](#) defines data management interfaces for intelligent edge computing-based smart agriculture service. The data management interface includes data resources and interfaces for data processing. Data resource can be used to decide what data are for. There are a lot of data needed to check environment and crop-growing status. The interfaces for data Agriculture, data management, edge. Processing defines web-based application programming interface (API) including data creation, retrieving, update and deletion.
- [ITU-T Q.5029 “Data management interfaces in digital twin smart aquaculture system with intelligent edge computing”](#) defines signalling messages for network functions and intelligent data processing. However, in addition to the defined signalling messages, it is needed to support an API such as Web API in order to accommodate legacy devices which only support Web-based communications. In addition, service-specific API will be helpful to support service-specific functions. This draft Recommendation defines data management interfaces for intelligent edge computing-based digital twin smart aquaculture service.
- [ITU-T Q.5030 “Data management interfaces for intelligent edge computing-based flowing-water smart aquaculture system”](#) defines signalling messages for network functions and intelligent data processing. However, in addition to the defined signalling messages, it is needed to support an API such as Web API in order to accommodate legacy devices which only support Web-based communications. In addition, service-specific API will be helpful to support service-specific functions.
- [ITU-T Q.5031 “Protocol for traffic flow coordination of multi-modality communication”](#) specifies protocols, signalling flow and message format for multi-modality communication. It specifies traffic coordination between two or more traffic flows of one terminal, two or more traffic flows of two more terminals.

- [ITU-T Q.5032 “Network coding protocol for network repeaters”](#) considers networks with repeaters. A repeater is usually a device designed to receive a signal from a remote transmitter and then retransmit this signal to a remote receiver that unable to receive a signal from the original transmitter without retransmission due to certain conditions, for example, due to too large a distance, transmission medium, low power of the source signal, or other reasons. Implementation of network coding at repeater with a two-way relay channel allows to reduce the network load and, consequently, data transmission delays in such networks. This Recommendation includes: - Description of a network architecture where the protocol could be implemented. - Coding and decoding procedures. - Packet types and formats. - Signaling procedures and diagrams.
- **ITU-T Q.5054 “Consumer centric framework for combating counterfeit and stolen ICT mobile devices” (under approval):** The purpose of this recommendation is to provide a consumer centric framework through unified platform combining all scenarios for combating counterfeit and stolen devices as covered in Q.5050 Recommendation Series. Consequently, it aims to define possible channels for consumer interfaces, North Bound and South Bound interfaces, query and response format, implementation scenarios, key features of platform, including approach for consumer education and awareness. Further, the technical challenges inter-alia related to vendor agnostic interfaces, mobile equipment bulk registration, dealing with cloned IMEI, reporting of stolen/lost or restored equipment will also be addressed.
- **ITU-T Q.5055 “Technical requirement, interfaces and generic functions of CEIR” (under approval)** provides detailed technical description of the CEIR system, its requirements, interfaces and basic functions that should be provided by the system and also some optional features – which may be used considering the client specific requirements. It also describes the different stakeholders of the CEIR system and their indented/expected roles and responsibilities.
- [ITU-T Q.Suppl.76 “Common approaches and interfaces for data exchange between CEIR and EIR”](#): As defined on the ITU-T Q.5050 series, CEIR can be used to combat counterfeit ICT devices, to combat the use of stolen ICT devices and for other purposes. However, implementing a CEIR is a complex project that involves and impacts multiple stakeholders, and may require different processes in each country. Therefore, to assist ITU members on implementation, this supplement aims to identify current industry approach on the data exchange between CEIR and EIR and propose common approaches and interfaces on this topic.
- [ITU-T Q.Suppl.77 “Signalling requirements for parallel SFC packet processing”](#) describes the signaling requirements of parallel SFC packet processing. This supplement focuses on the signalings among the controller, classifier and service function forwarders.
- [ITU-T T.86 \(V2\) \(revised\) “Information technology - Digital compression and coding of continuous-tone still images: APPn Markers”](#) provides definitions for JPEG application specific markers (APPn) found in Rec. ITU-T T.81 | ISO/IEC 10918-1 and

Rec. ITU-T T.84 | ISO/IEC 10918-3. This 2nd edition integrates the provisions of Amendment 1 of ITU-T T.86 (2012) | ISO/IEC 10918-4 (2013) and cancels the provisions concerning the registration authority processes originally defined in the 1st edition. ITU-T T.86 is a common text with ISO/IEC 10918-4.

- [ITU-T T.800 \(V4\) \(revised\) “Information technology - JPEG 2000 image coding system: Core coding system”](#) defines a set of lossless (bit-preserving) and lossy compression methods for coding bi-level, continuous-tone grey-scale, palletized colour, or continuous-tone colour digital still images. This Recommendation | International Standard: – specifies decoding processes for converting compressed image data to reconstructed image data; – specifies a codestream syntax containing information for interpreting the compressed image data; – specifies a file format; – provides guidance on encoding processes for converting source image data to compressed image data; – provides guidance on how to implement these processes in practice.
- [ITU-T T.803 \(V3\) \(revised\) “Information technology - JPEG 2000 image coding system: Conformance testing”](#) contains a normative electronic attachment with the codestreams used in the application of the procedures described herein that is available from ITU at <https://www.itu.int/net/itu-t/sigdb/speimage/ImageForms.aspx?val=10100803>† or from ISO at <https://standards.iso.org/iso-iec/15444/-4/ed-4/en>.
- [ITU-T T.816 “Information technology - JPEG 2000 image coding system: Extensions for coding of discontinuous media”](#) provides extensions of the scalable image coding tools described in Rec. ITU-T T.800 | ISO/IEC 15444-1 and Rec. ITU-T T.801 | ISO/IEC 15444-2, of two types.
- [ITU-T T.873 \(V3\) \(revised\) “Information technology - Digital compression and coding of continuous-tone still images: Reference software”](#) was developed jointly with ISO/IEC JTC 1/SC 29/WG 1 (JPEG), and corresponds as common text with ISO/IEC 10918-7. This third edition cancels and replaces the second edition, which has been technically revised. The main changes compared to the previous edition are as follows: This second edition updates Reference Software A to release 1.65, and Reference Software B to release 3.0.0. This version of Reference Software A corrects implementation errors and improves the overall stability of the software.
- [ITU-T Y.1567 “Latency Under Load metrics and methods of measurement”](#) specifies metrics of latency under simultaneous traffic load, and defines methods of measurement to increase the specificity and repeatability of metric assessment.
- [ITU-T Y.2249 “Service model for human-centric touring guide with augmented reality”](#) specifies a service model for a human-centric touring guide with augmented reality (AR), including the concept, reference architecture, service requirements, and specific application scenarios of the service model. This Recommendation can be used to guide AR-based cultural tourism service providers to develop a service model for human-centric touring guide with AR.
- [ITU-T Y.2250 “Requirements and Framework of Human-oriented Message Service for Smart Learning in Future Network”](#) specifies the requirements of human-

oriented message service in context of interaction between service user and smart learning devices. Based on these requirements, a framework of the human-oriented message service for smart learning is developed. The requirements and framework provide convenient and simple implementation for the message interaction between service user and the smart learning devices.

- **ITU-T Y.2256 “Overview of Unmanned Smart Farm based on networks” (under approval)** provides an overview of Unmanned Smart Farms based on networks. The scope of this Recommendation includes a Reference Architecture and identifies services required to support Unmanned Smart Farms.
- [ITU-T Y.2325 “Architectural evolution for Next Generation Network control plane by applying Software-Defined Networking technology”](#) aims to standardize an evolved NGN control plane architecture which is scalable, simplified and flexible by decoupling the end-user signalling handling functionality and the user plane control functionality and also treating the signalling as a user service (data) leading to uniform handling of services. This recommendation includes the description of information flow for services such as network attachment, session establishment and registration etc. for the recommended architecture.
- [ITU-T Y.2344 “Scenarios and requirements of Intent-Based Network for network evolution”](#) specifies metrics of latency under simultaneous traffic load, and defines methods of measurement to increase the specificity and repeatability of metric assessment. aims to provide the scenarios and requirements of Intent-Based Network for network evolution. The scope of this Recommendation includes: Scenarios and workflow of Intent-Based Network for network evolution. Capability requirements of Intent-Based Network for network evolution. General framework of Intent-Based Network for network evolution.
- [ITU-T Y.2346 “Requirements and framework of Service Function Orchestration based on service function chaining”](#) provides the scenarios, requirements and framework of service function orchestration based on service function chaining. Based on user requirement, service function orchestration can realize function services deployment and dynamically adjustment on demand, and based on resource situation, it can realize the resource optimization and load balance of service functions.
- **ITU-T Y.2502 “Computing power network - Authentication and orchestration architecture”** provides the architecture of resource authentication and orchestration in computing power network (CPN) such as resource discovery, resource registration, resource identification, resource orchestration in order to agilely organize and utilize the computing, storage, and network resources in the computing power network to provide services to computing power network consumers.
- [ITU-T Y.2776 “Deep packet inspection - intelligent management and maintenance of policy information base”](#) specifies intelligent management and maintenance aspects for policy information base of DPI. The scope of this Recommendation includes the following aspects: Problems analysis for policy information base of

DPI; functional architecture of intelligent management and maintenance of policy information base (PIB-IMM), implementation methods for the PIB-IMM, functional requirements for PIB-IMM, performance aspects for PIB-IMM, consideration for control plane of PIB-IMM, consideration for management and application of PIB-IMM, and security consideration etc.

- [ITU-T Y.3073 \(2019\) Amd.1 “Framework for service chaining in information-centric networking”](#) was produced to support the non-linear structures of service function chaining in information centric networking (ICN). It adds the requirements in message content and naming scheme in applying to non-linear structures of service function chaining.
- [ITU-T Y.3083 “Information-centric networking in networks beyond IMT-2020: Reference model of on-site, elastic, and autonomous network”](#) describes the elastic and autonomous information-centric networking (ICN), which can meet all the requirements of look-up-based forwarding in ICN described in [ITU-T Y.3075], and its capabilities of on-site forwarding and processing, elastic managing, and autonomous name mapping and resolving to support instant re-addressing and routing efficiently. It describes the reference model, interaction mechanism of different components, and the deployment considerations.
- [ITU-T Y.3091 “Digital twin network - Capability levels and evaluation methods”](#): Digital twin network is a virtual representation of the physical network. It is useful for analyzing, diagnosing, simulating and controlling the physical network, and can help the physical network achieve intelligent decision-making and predictive maintenance. This Recommendation specifies the capability levels and evaluation methods of DTN system to help the telecommunication industry reach a consensus on indicating DTN’s capability levels, as well as DTN’s technical maturity levels.
- [ITU-T Y.3185 “Functional architecture for intelligent awareness of network requirements”](#) specifies the functional architecture of intelligent awareness of network requirements. The scope of this Recommendation includes the following aspects related to intelligent awareness of network requirement: introduction of intelligent awareness of network requirement; general functional architecture; network service data based functional architecture; crowd sourcing based functional architecture; functional architecture of requirement descriptor; functional architecture of requirement broker; functional architecture of requirement evaluator.
- [ITU-T Z.161 \(revised\) “Testing and Test Control Notation version 3: TTCN-3 core language”](#) describes the VMMA concept, the VMMA framework, the functional requirements, the functional APIs and the reference parameters. Some detailed use cases and reference APIs are described in the appendix.
- [ITU-T Z.166 \(revised\) “Testing and Test Control Notation version 3: TTCN-3 control interface \(TCI\)”](#) specifies the control interfaces for Testing and Test Control Notation 3 (TTCN-3) test system implementations. The TTCN-3 control interfaces (TCIs) provide a standardized adaptation for management, test component

handling and encoding/decoding of a test system to a particular test platform. This Recommendation defines the interfaces as a set of operations independent of a target language.

- [ITU-T Z.171 \(revised\) “Testing and Test Control Notation version 3: Using JSON with TTCN-3”](#) specifies the rules to define schemas for JSON data structures in TTCN 3, to enable testing of JSON-based systems, interfaces and protocols, and the conversion rules between TTCN-3 and JSON to enable exchanging TTCN 3 data in JSON format between different systems.
- [ITU-T Technical Report HSTP-CONF-H870 \(V2\) \(revised\) “Testing of personal audio systems for compliance with ITU-T H.870”](#) describes the testing of the compliance of various personal audio systems/devices to the essential/mandatory and optional features of [ITU-T H.870V2].
- [ITU-T Technical Report HSTP-DLT-CG “Construction guidelines for city-level distributed ledger technology \(DLT\) infrastructure”](#) provides the city-level distributed ledger technology (DLT) infrastructure application model including relevant parties, construction principles and key processes. Relevant parties are divided into governance parties, business parties, user parties, technology providers and third-party support parties. Construction principles include compliance principles, security principles, hierarchical authorization principles, high availability principles, and traceability principles. The key process is divided into design system reference architecture, construction of standard specification system and construction of security assurance system.
- [ITU-T Technical Report “The Potential of Distributed Ledger Technology to Improve Management of Universal Service Funds”](#) explores the use of Distributed Ledger Technology (DLT) for the management of funds in the Universal Service Financing projects to enhance transparency and efficiency. The purpose of this technical report is to identify ways to reduce process inefficiency in centralized systems, facilitating the prudent and transparent use of funds and providing a clear and automatic definition of the roles and responsibilities of all stakeholders in the new distributed framework. At the same time, this report also highlights the challenges that come with new DLT ecosystem such as standardization of DLT frameworks, interoperability and regulatory mechanisms.
- [ITU-T Technical Report on “Dispute Resolution Processes \(previously “Dispute Resolution Related to Charging and Invoicing”\)”](#) is meant to help ITU members to understand the origin, nature and dynamics of the conflicts between traditional telecommunication services providers and over-the-top (OTT) providers in order to get information that allows Member States design regulatory framework and principles leading to establish agile and transparent procedures for the dispute resolutions in the context of the mentioned relationship. This task is not simple, bearing in mind the changing scenario in the telecommunication/ICT market, therefore, this document promotes flexible, transparent and collaborative frameworks and principles to conduct the conflict resolutions.

- [ITU-T Technical Report on “5G related policy considering MVNOs”](#) seeks to study the various economic and policy aspects related to IMT2020 technologies taking into consideration MVNOs. In addition, it presents an overview of 5G deployment and MVNOs, a detailed review of MVNO conceptual models as well as drivers and barriers to MVNO rollout. The report also presents various case studies from Member States in order to inform best practices.
- [ITU-T Technical Report on “OTT Bypass”](#): Although OTT Bypass may broadly affect other services, the focus of this Technical Report is restricted to the bypass of standard international voice calls. This Technical Report describes OTT bypass and provides economic and policy background on its nature and implications, and discusses impacts to stakeholders including regulators and consumers, policy challenges, protection of users amongst other issues. It also provides a working definition of OTT bypass and a country case study.
- [ITU-T Technical Report on “Operation Requirements for Federated Machine Learning based Applications”](#) provides operation requirements for federated machine learning based applications, specifies operation functional framework and description on operation functional components.
- [ITU-T Technical Report on “Operation Requirements for Federated Machine Learning based Applications”](#) addresses aspects related to delivering free to view television and other audiovisual signals to smartphones and other portable devices using the wireless local area network/ Wi-Fi constituting the last mile of secondary distribution TV network. In other words, the scope of the draft Technical Report is intended to cover the last mile connection via the wireless local area network/ Wi-Fi interconnected with the conventional TV transmission modes of satellite, cable, or terrestrial.
- [ITU-T Technical Report on “Operation Requirements for Federated Machine Learning based Applications”](#): A Common User Profile (CUP) format used to personalize audiovisual media is intended to assist users who have different ranges of abilities to make audiovisual content more accessible. The CUP is targeted at broadband, digital TV, computer and smart phone software and web-based audiovisual systems. The CUP is independent of the device or application being used and is intended through a software agent stored in the user’s device or devices, to personalize the media experience by adapting the devices interface parameters such as the displayed captions font size, colour and contrast, the audio dialogue balance, volume and equalisation, the size and position of on-screen elements etc. The CUP application can also be used to create synthetic profiles which can be used to simulate the effect of parameter adjustment on different devices allowing developers to assess features on different persons with different ranges of abilities.
- [ITU-T Technical Report on “Use Cases on the combat of Multimedia Content Misappropriation”](#) aims to collect use cases from ITU Members that reflects challenges, opportunities, and results on the combat of multimedia content misappropriation and, with this information compendium, assist ITU members in

engaging this problem. To facilitate this information collection, this document proposed a template to be used when including information from new sources, that can either be members state engaging the problem or solution providers.

- [ITU-T Technical Report on “RF level based single-number indicator for mobile network usefulness for a given range of applications”](#) describes a framework and methodology for a spatially resolved single-number indicator expressing mobile network usefulness for a given range of purposes.
- [ITU-T Technical Report on “Optical fibres, cables and systems”](#) The ITU-T has published a complete set of Recommendations dealing with these topics: Recommendations and Supplements of the ITU-T G-series on optical fibres and systems and Recommendations and Supplements of the ITU-T L-series on construction, installation, jointing and termination of the optical cables. This report was prepared by the Rapporteurs and editors of WP2/15 responsible for developing those Recommendations and is meant to provide an introduction to them, but can also act as an introductory overview to the rapidly developing world of fibre optic communications.
- [ITU-T Technical Report on “Guide on the use of ITU-T L-series Recommendations related to optical technologies for outside plant”](#) provides information on the background, development and uses of L-series Recommendations prepared by Working Party 2 of ITU-T Study Group 15. These Recommendations are related to the design, construction, maintenance and operation of the optical fibre outside plant. The items covered are related to the following areas: – optical fibre cable characteristics, evaluation and installation techniques; – construction of optical infrastructure; – network design; – network maintenance and operation, including disaster management; – passive optical components.
- The [Financial Inclusion Global Initiative \(FIGI\)](#) is a three-year programme of collective action led by ITU, the World Bank Group and the Committee on Payments and Market Infrastructures, with support from the Bill & Melinda Gates Foundation. FIGI is designed to advance research in digital finance and accelerate digital financial inclusion in developing countries concluded at the end of 2021. The [ITU DFS Security Lab](#) was set up as part of FIGI activities and developed a standard methodology based on the OWASP Mobile Top 10 Security Risks for conducting security tests for mobile payment apps based on USSD, STK, and Android.
- The activities of the DFS security lab include a) organization of [ITU DFS Security Clinics](#) to offer guidance to regulators and DFS providers on adoption of the DFS security recommendations developed under FIGI, b) providing assistance to regulators through the knowledge transfer programme in establishing their own security labs and to implement the security methodology to conduct security audits of mobile payment applications based on USSD, iOS, and Android and c) conduct security audits on mobile payment apps at the request of DFS regulators and DFS providers.
- The DFS Security Lab conducted some 22 security clinics, welcoming over 500 participants, in 2022 and 2023 in Africa, Asia Pacific and Latin America regions.

Under the knowledge transfer programme ITU has provided technical assistance to telecom regulators from Tanzania, Peru, The Gambia and Uganda Telco to set up the DFS Security Lab and guidance to the staff of the regulatory bodies on how to conduct the security audits of mobile payment apps used in their countries.

67. The [United for Smart Sustainable Cities \(U4SSC\)](#) initiative, supported by 20 UN entities, advocates for public policies encouraging the responsible use of information and communications technologies (ICTs) and ICT standards in particular – to contribute to economic, environmental, and social sustainability, as well as to advance the 2030 Agenda for Sustainable Development, the Pact for the Future, and its Global Digital Compact.
68. More than 200 cities worldwide are evaluating their progress towards the SDGs with “[Key Performance Indicators for Smart Sustainable Cities](#)” based on ITU standards, indicators promoted by U4SSC. New U4SSC reports include “[Building digital public infrastructure for cities and communities](#)”, “[Methodology to Assess Net Zero Progress in Cities](#)”, “[Guidelines for cities to achieve carbon Net Zero through digital transformation](#)”, “[Policy benchmarks for digital transformation of people-centred cities](#)”, “[Data and API requirements for centralized smart city platforms](#)”, “[Guiding principles for artificial intelligence in cities](#)”, “[Reference framework for integrated management of an SSC](#)”, “[Procurement guidelines for smart sustainable cities](#)”, “[Compendium of practices on innovative financing for smart sustainable cities projects](#)”, “[Smart tourism: A path to more secure and resilient destinations](#)”, “[Redefining smart city platforms: Setting the stage for Minimal Interoperability Mechanisms](#)”, “[Smart public health emergency management and ICT implementations](#)”, “[Compendium of survey results on integrated digital solutions for city platforms around the world](#)” and “[Digital solutions for integrated city management and use cases](#)”, as well as a range of [city snapshots, factsheets and verification reports](#) sharing the results of the latest KPI evaluations.
69. The first United for Smart Sustainable Cities (U4SSC) Austrian U4SSC Country Hub is hosted by the Austrian Economics Center in Vienna, Austria. The city of Kyebi, Ghana, has also set up a U4SSC Country Hub in Ghana. The main objective of this country hub is to promote the work of U4SSC.
70. U4SSC is working on the following Thematic Groups:
 - City Platforms;
 - Artificial intelligence in cities;
 - Digital transformation for people-centred cities;
 - Digital Public Infrastructure (DPI) for cities;
 - Social-cultural sustainability in people-centred city governance;
 - Sustainable Digital Transformation in Buildings and Urban Energy;
 - Developing a Guiding Principles & Frameworks for people-centred smart cities toolkit; and
 - Future Foresight for Cities.
71. The [AI for Road Safety initiative](#) was launched on 6 October 2021 by ITU together with UN Secretary-General’s Special Envoy for Road Safety and the UN Envoy on

Technology. Since its establishment the AI for Road Safety initiative has been functioning in line with the UN General Assembly Resolution on Improving global Road Safety, and the UN Secretary General's roadmap on digital cooperation. The activities of this initiative are oriented towards the United Nations Sustainable Development Goals, especially Target 3.6 to halve by 2030 the number of global deaths and injuries from road traffic accidents, and the SDG Goal 11.2 to provide access to safe, affordable, accessible and sustainable transport systems for all by 2030. In accordance with its scope, this initiative will continue to organize Webinars, challenges and explore the AI for Road Safety readiness landscape.

72. The [ITU/WMO/UNESCO-IOC Joint Task Force on SMART¹ Cable Systems](#) is leading an ambitious project to equip submarine communications cables with climate and hazard-monitoring sensors to create a global observation network capable of providing earthquake and tsunami warnings as well as data on ocean climate change and circulation.

The information from SMART cables can be used for:

- Climate change monitoring including ocean circulation, heat content and sea level rise;
- Tsunami and earthquake early warning for disaster risk reduction;
- Seismic monitoring for earth structure and related hazards;
- Quantifying risk to inform sustainable development of coastal and offshore infrastructure, and
- Warning of external hazards to cables, and improved routing of cable systems

Several recent events have contributed to positive developments:

- SMART Cables project was endorsed by UN Decade of Ocean Science for Sustainable Development 2021-2030. Details are at <https://oceandecade.org/actions/smart-cables-for-observing-the-global-ocean/>.
- The Portuguese Government, with guidance from its telecom regulatory agency ANACOM, is deploying the new CAM ring (Continent (Lisbon)-Azores-Madeira) The new CAM ring is expected to be in operation in 2025/2026 and likely be the first SMART cable system.
- ITU-T Study Group 15 (SG15) has approved Recommendation ITU-T G.9730.2 on SMART cables together with Recommendation ITU-T G.9730.1 on dedicated scientific sensing submarine cable system under Question 8/15 (Characteristics of optical fibre submarine cable systems).
- The 10th workshop on JTF on SMART cables was held on 20 January 2024 in Honolulu, United States.
- ITU-T Study Group 5 has started a new work item on Impact assessment framework for evaluating how ICT-based subsea infrastructure could support climate, environmental and biodiversity monitoring in the oceans. This Recommendation will help countries in becoming more resilient for climate change as it will help in

¹ Science Monitoring and Reliable Telecommunications

creating metrics to assess how SMART Cables are helping to monitor in real time key climate indicators, such as (but not limited to): temperature of the bottom of the sea, level of sea rising, salinity and even biodiversity. It will also develop a metric related to the impact of SMART Cables on Climate change resilience in a given region or area.

73. ITU is carrying out various activities to encourage and facilitate the participation of academia in the work of the Sector, as well as to benefit from their technical and intellectual expertise.

ITU Journal

The [ITU Journal on Future and Evolving Technologies](#) (ITU J-FET) is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. Free and for all, this publication addresses fundamental and applied research sharing new techniques, concepts, analyses, and tutorials while discussing implications of the latest research on policy, regulations, legal frameworks, the economy and society. The ITU Journal welcomes submissions at any time, on any topic within its scope and publishes papers quarterly. In less than three years, over 160 papers have been published - authored by over 700 researchers (72% of which come from academia), exploring areas of high relevance to the whole ITU, spanning from telecommunication and radiocommunication standardization to policy and regulatory issues. This year, Volume 4 will feature regular papers and seven special issues papers. The following issues are still calling for papers:

- [AI for accessibility](#)
- [Metaverse: Communications, networking and computing](#)
- [Intelligent technologies for future networking and distributed systems](#)
- [Satellite constellations and connectivity from space](#)
- [Next generation computer communications and networks](#)

All published papers are available to download free of charge from the [ITU Digital library](#).

The joint ITU and Tsinghua University Press journal , Intelligent and Converged Networks (ICN), is a quarterly publication and published 84 papers since its establishment in June 2020. All publications are available for free download on the [IEEE Xplore Digital Library](#).

ITU Kaleidoscope Academic conference

The ITU Kaleidoscope series of peer-reviewed academic conferences – technically co-sponsored by the IEEE and IEEE Communications Society (IEEE ComSoc) – calls for original research on ICT innovation and related demands on international standardization.

Innovation to match the world's growing metaverse ambitions was in focus at Kaleidoscope 2022: [Extended reality – How to boost quality of experience and](#)

interoperability. This 14th^{ed} edition of the ITU Kaleidoscope conferences provided a forward-looking perspective on the future development and widespread adoption of extended realities. Kaleidoscope 2022, hosted by the Ministry of Communications and Digitalisation and the Ghana-India Kofi Annan Centre of Excellence in ICT, took place in Accra, from 7 to 9 December at the National Communications Authority of Ghana, with options also available for remote, online participation. The conference programme featured four keynote sessions, an invited paper, an invited talk, three paper sessions, one video demo, and a students' exhibit. Full papers are reproduced in the [Conference Proceedings](#) and are also available on the [IEEE Xplore Digital Library](#). The best papers are being evaluated for potential publication in the IEEE Communications Standards Magazine and other international journals. An evaluation of all Kaleidoscope 2022 papers with respect to relevance in ITU activities was presented at TSAG, 12-16 December 2022, and submitted to RAG and TDAG. The next edition of the conference is under preparation and will be held in 2024.

74. Resolution 177 on Conformance and Interoperability (Rev. Bucharest, 2022) endorsed the objectives of both Resolution 76 (Rev. Geneva, 2020) and Resolution 47 (Rev. Kigali, 2022) on conformity and interoperability of ICT equipment. The goal of Resolution 76 (Rev. Geneva, 2022) on Conformance and Interoperability testing is to help in increasing probability of interoperability and to ensure all the countries to benefit of ICTs. WTDC-22 reviewed Resolution 47 on enhancement of knowledge and effective application of ITU Recommendations in developing countries, including Conformance and Interoperability (C&I) testing of systems manufactured on the basis of ITU Recommendations. C&I issues are in the Dubai Declaration and are part of Regional Initiatives for AFR and ARB.
75. According to Resolution 76 (WTSA-20), the Conformity Assessment Steering Committee ([ITU-T CASC](#)), which works under auspices of SG11, studies and defines an ITU procedure to recognize testing laboratories that are competent to test according to ITU-T Recommendations, in collaboration with existing accreditation bodies.
76. ITU continues its collaboration with ILAC and IAF on TL recognition procedures. In August 2022, all three entities signed the updated MoU which among other activities includes a new TL recognition procedure (see [here](#)). In addition, ILAC developed its own assessment procedure to explain the operation of the set-up (see [here](#)). The detailed information on ILAC-ITU partnership is available [here](#).
77. Following the [TSB Circular 368](#), TSB received several requests from TLs seeking ITU recognition. As of June 2024, there are 14 Testing Laboratories registered in the ITU Testing Laboratories database (<https://itu.int/go/tldb>). The announcements about recognized TLs were also issued via ITU Operational Bulletins ([OB.1253](#), [OB.1256](#), [OB.1263](#), [OB.1266](#), [OB.1283](#), [OB.1286](#) and [OB.1293](#)). Testing Laboratories keep TSB updated on any changes in their scope of accreditation and its validity.
78. CASC updated the list of ITU-T technical experts based on the inputs received from ITU-T SGs and according to the criteria and procedures defined in cl.9.1 of [ITU-T Guideline](#) "ITU-T CASC procedure to appoint ITU-T technical experts" (2019). The

updated list of ITU-T Technical experts is available on the CASC webpage at: <https://itu.int/go/casc>.

79. In response to requests from ITU members, ITU organized a [Tutorial on Testing Laboratories recognition procedure](#). This tutorial aimed to guide all stakeholders on the Testing Laboratories recognition procedure established by ITU, its benefits, and all the logistical details needed for submitting applications.
80. In May 2023, SG11 updated its C&I Action plan which allows TSB to maintain [reference table](#) of standards are used for C&I assessment. This reference table provides guidance when populating the ITU Product Conformity Database. As a result, the GPON ONT end-device, which was tested by recognized TL, was registered in the ITU Product Conformity Database (<https://itu.int/go/tcdb>) under a new ICT product category “optical fiber equipment”.
81. A helpful [video guideline](#) about ITU Testing Laboratories and the ITU Product Conformity Databases is available at the ITU C&I Portal (<https://itu.int/go/citest>).
82. The “[ICT Product Conformity Database](#)” provides industry with a means to publicize the conformance of ICT products and services with ITU-T’s international standards. Currently, the C&I database lists e-health devices, mobile phones, Ethernet services, IPTV, Optical fiber equipment and Mobile Number Portability systems (MNP).
83. The [C&I Portal](#) is responsible to gather all information about the work done in Pillars 1 (conformance assessment) and 2 (interoperability); as Pillars 3 (capacity building) and 4 (assistance in the establishment of test centres and C&I programmes in developing countries).

Under the pillars 3 and 4 of the C&I programme, the following activities have been conducted:

- i) [ITU guidelines](#) have been published on C&I:
- ii) [Guidelines](#) for the development, implementation and management of mutual recognition arrangements/agreements (MRAs) on conformity assessment;
- iii) [Feasibility Study](#) for the establishment of a Conformance Testing Center;
- iv) [Guidelines](#) on Establishing Conformity and Interoperability Regimes – Basic and Complete Guidelines;
- v) [Guidelines](#) for Developing Countries on establishing conformity assessment test labs in different regions;

84. ITU has organized [C&I training events and workshops in the regions](#). During these events, key issues were discussed highlighting the relevance of accreditation and certification, including technical collaboration and different C&I testing domains.



85. ITU [assessment studies](#) in the regions helped to determine C&I areas of commonalities and differences in the concerned countries, allowing to assessing the present situation in each beneficiary country and proposing a common C&I regimes for the participant countries.
86. ITU-D Study Group 4 Question 2 (Q4/2), revised by WTDC-202, has its current Study Period ongoing (2022-2025), under the title: Telecommunication/ICT equipment: Conformance and interoperability, combating counterfeiting and theft of mobile devices - website. Outcomes from previous Study Period: [Q4/2 Report \(2021\)](#): Assistance to developing countries for implementing conformance and interoperability programmes and combating counterfeit information and communication technology equipment and theft of mobile devices; and promotional [video](#).
87. ITU [assessment studies](#) in the regions helped to determine C&I areas of commonalities and differences in the concerned countries, allowing to assessing the present situation in each beneficiary country and proposing a common C&I regimes for the participant countries.
88. ITU-D Study Group 4 Question 2 (Q4/2), revised by WTDC-202, has its current Study Period ongoing (2022-2025), under the title: Telecommunication/ICT equipment: Conformance and interoperability, combating counterfeiting and theft of mobile devices - website. Outcomes from previous Study Period: [Q4/2 Report \(2021\)](#): Assistance to developing countries for implementing conformance and interoperability programmes and combating counterfeit information and communication technology equipment and theft of mobile devices; and promotional [video](#).
89. ITU has developed an [‘EMF Guide mobile app’](#) providing an up-to-date reference of the EMF information provided by the [World Health Organization](#) and ITU. The ‘EMF Guide mobile app’ is available in 6 languages and includes relevant information related to 5G.
90. The Radiocommunication Bureau (BR) continues work within its mandate that contributes to the implementation of WSIS Action Lines and the SDGs. The ITU Radiocommunication Sector (ITU-R) continues to contribute to implementing the outcomes of the World Summit on the Information Society and the 2030 Agenda for Sustainable Development, in response to [Resolution ITU-R 61](#). The following link contains a comprehensive list of ITU-R publications linked to the SDGs, these include ITU-R Recommendations, Reports, Handbooks and Questions relevant to the WSIS

Action Lines: <https://www.itu.int/en/ITU-R/study-groups/Pages/Sustainable-dev-goals.aspx>.

Action Line C4: Capacity-Building



Related to SDGs: SDG 1 (1.b), SDG 2, SDG 3 (3.7, 3.b, 3.d), SDG 4 (4.4, 4.7), SDG 5 (5.5, 5.b), SDG 6 (6.a), SDG 12 (12.7, 12.8, 12.a, 12.b), SDG 13 (13.2,



91. Within the framework of its mandate as facilitator for Action Line C4, the ITU organized the facilitation meeting of Action Line C4 on *Emerging technologies in the world of work: Addressing challenges through digital skills* together with the Action Line C7: E-employment. This session explored the critical role of digital skills on employment, particularly in light of the impact of AI on the world of work. It delved into how targeted and tailored digital skills training can empower individuals, bridge the digital divide, and create new pathways for employment. For more details on the sessions and the outcomes, please see [here](#).
92. The Action Line 4 thematic is linked to many SDGs.
- SDG 1: development of domestic policies to ensure that ICTs are fully integrated in education and training at all levels. Creation of policy frameworks requires stakeholder engagement, analysis and interpretation of data for targeted policy interventions which can be achieved through skills development programs.
 - SDG 2: With the emergence of e-agriculture and the growing need for the knowledge in the use of ICT's, capacity building interventions focused at development and promotion of programmes to eradicate illiteracy using ICTs at national, regional and international levels, will contribute to knowledge growth and inclusion. It also focuses on building the capacity to use ICT tools to increase crop production, adopt modern farming methods, predict weather patterns, and in the process work towards eliminating hunger and creating food security.
 - SDG 3: To support research and strengthen capacity of developing countries for early warning, risk reduction and management of national global health risks, activities include design of specific training programmes in the use of ICTs in order to meet the educational needs of information professionals, such as archivists, librarians, museum professionals, scientists, teachers, journalists, postal workers and other relevant professional groups which focuses not only on new methods and techniques for the development and provision of information and communication services, but also on relevant management skills to ensure the best use of technologies.
 - SDG 4: Action Line C4 focuses on development and promotion of programmes to eradicate illiteracy using ICTs at national, regional and international levels, with the aim of increasing the number of people with relevant ICT skills and to facilitate employment and entrepreneurship in the ICT sector.

- SDG 5: Work on removing the gender barriers to ICT education and training and promoting equal training opportunities in ICT-related fields for women and girls, is part of the action line, with early intervention programmes in science and technology targeting young girls with the aim of increasing the number of women in ICT careers as well as promotion the exchange of best practices on the integration of gender perspectives in ICT education.
 - SDG 6: Development of distance learning, training and other forms of education and training as part of capacity building programs, is part of the capacity building initiatives that supports countries interventions giving special attention to developing countries and especially LDCs in different levels of human resources development.
 - SDG 12: Raising awareness on sustainable consumption and production in today's era requires the use of technology. The action line therefore impacts on this SDG by enhancing technological capacity of countries through training and development initiatives that target ICT's and related areas, as well as building a more inclusive information society.
 - SDG 13: WSIS Action Line C4 promotes creation by governments, in cooperation with other stakeholders, of programs for capacity building with an emphasis on building a critical mass of qualified and skilled ICT professionals and experts.
 - SDG 14: Empowering communities in ICT use and promoting the production of useful and socially meaningful content is a capacity building intervention that can increase scientific knowledge and promote innovation and research.
 - SDG 16: WSIS Action Line C4 focuses on promotion of international and regional cooperation in the field of capacity building, including country programmes developed by the United Nations and its specialized agencies.
 - SDG 17: Capacity building initiatives contributes to the SDG through the design and implementation of regional and international cooperation activities to enhance the capacity, notably, of leaders and operational staff in developing countries and LDCs, to apply ICTs effectively in the whole range of educational activities. Also, through the launch of pilot projects to design new forms of ICT-based networking, linking education, training, and research institutions between and among developed and developing countries and countries with economies in transition.
93. The WSIS Prizes 2025 Winner for the Action Line C4 is: National Information Dissemination Centre, Malaysia. Details of the project are available [here](#).
94. The [ITU Academy](#) portal continues to be the main gateway to ITU's capacity development and training activities. It offers ICT professionals and policymakers access to capacity development opportunities using various methodologies and tailored to different learning styles, such as online self-paced or instructor-led courses. In 2025, the platform welcomed over 17,000 new learners, which puts the total user base of ITU Academy at nearly 75,000 learners, coming from 180 countries. The course catalogue was diversified to include emerging areas such as artificial intelligence, quantum technologies, and data governance, while continuing to offer

long-standing programs on spectrum, regulation, and digital policy. Learner satisfaction remained consistently high, with 98% of participants rating their courses positively, confirming the platform's relevance and accessibility. A new design was developed in 2025, facilitating catalogue organization, visibility as well as the overall navigation experience for the users. Leveraging the ITU-developed technology, and aligning with the organization's main systems, an automated translation feature was launched, allowing learners to access the interface in any of the six official UN languages.

95. Following the adoption of the priority areas for the next four years by the World Telecommunication Development Conference (WTDC 2022), one of ITU's key training delivery mechanisms, the Centres of Excellence programme was replaced by the ITU Academy Training Centres (ATCs) programme. A total of 14 centres were selected to begin working in 2023. From January to mid-September 2025, the ATC programme trained over 800 professionals from the ICT, public and private sector, with a total of 54 courses offered by the participating ATC institutions in the same period. Over 75% of the ATC courses are offered via an online, instructor-led modality, allowing for a global reach of the programme, in accordance with its remit. Additionally, it places an emphasis on learners coming from developing countries, as is the case for over 70% of participants in ATC trainings. The ATC annual coordination meeting (which took place in June 2025 in Santo Domingo, Dominican Republic) ensured harmonized standards, enabling the Centres to act not just as training providers but as hubs for knowledge exchange and quality assurance. More information on the ATC programme can be found here: <https://academy.itu.int/itu-d/projects-activities/itu-academy-training-centres>.
96. ITU continues to drive and move forward with the implementation of the [Digital Transformation Centres \(DTC\) Initiative, which was launched in 2019, in partnership with Cisco](#). The Initiative seeks to strengthen the digital capacities of citizens, particularly in rural and underserved communities through a global network of local institutions, the Digital Transformation Centres (DTCs). Six years since the inception of the Initiative, the Digital Transformation Centres (DTC) community has grown from an initial group of 9 centres to a network of 14 centres located across four regions. Since its launch, the Initiative has attained and exceeded the half-million milestone, with over 610,000 course participants trained, and a female participation ratio of more than 50%. More specifically, during the first half of 2025, the total number of participants trained reached 130,000, of whom 53% are women. New and tailored digital skills training curricula were brought to visually impaired learners in Pakistan, Ghana and Uganda. Train-the-trainer programmes were rolled out to expand local pools of instructors, ensuring sustainability and community ownership. By embedding capacity development directly within local institutions, the DTC initiative demonstrated how global partnerships can deliver tangible results at the grassroots level. More information on the DTC Initiative is available here: <https://academy.itu.int/itu-d/projects-activities/digital-transformation-centres-initiative>.

97. Funded by the European Union in the context of the Global Gateway, the 4-year “[Capacity Development for Digital Transformation](#)” project addresses the development needs of policymakers and government officials through targeted training on key topics linked to digital transformation. The project aims to enhance the knowledge and skills required to make informed decisions and policies in the digital era and to support a human-centric digital transformation globally. Through face-to-face and online training courses organized by ITU under the umbrella of the ITU Academy, in collaboration with [ITU Academy Training Centres](#), the project has so far organized 24 courses and trained 750 participants from around the world, with particular focus on developing countries.
98. A new project “Capacity development to accelerate school connectivity in collaboration with the Under the Giga Initiative” was launched in 2024. For school connectivity, the Giga Connectivity Forum 2025 brought together officials, development partners, and experts from 44 countries and territories to exchange solutions for accelerating school connectivity. Through the ITU Academy, the project Giga supported policymakers with training aligned to different stages of the connectivity journey. Two in-person trainings in Geneva in February and May courses delivered in 2025 trained 34 policymakers from 24 countries on infrastructure mapping and applied geospatial tools for school connectivity. Thirteen additional courses on school connectivity are under development for 2025 – 2026, covering topics such as financing, sustainable procurement, regulation, business modelling, cybersecurity, change management, satellite licensing, ecosystem measurement, and last-mile solutions.
99. ITU continues to lead the [Digital Skills Campaign](#) in partnership with ILO. The Campaign was launched in 2016 as one of eight thematic priorities under the ILO Global Initiative on Decent Jobs for Youth. It seeks to equip young women and men with the skills needed for the digital jobs of today and tomorrow. In 2021, the target was revised from commitments to train 5 million young people to training 25 million by the end of 2030. All commitments focus on job-ready, transferable digital skills, a combination of technical and soft skills that are aligned with the national and global market demand. Many of the trainings include work experience (e.g. internships and project-based learning) and job placement services to maximize employment outcomes and maintain close relationships with employers. As part of the Campaign, ITU disseminates best practices and guidelines through knowledge products such as the Digital Skills Toolkit and the Digital Skills Assessment Guidebook. As of March 2025, the campaign had received commitments to train more than 23 million young people with job-ready, transferable digital skills by 2030. The 19 partners who have made commitments under this initiative come from a range of sectors including government, development banks, NGOs, UN Agencies and the private sector
100. Close contact has continued with the BDT on work of mutual interest to ITU-R and ITU D. The Radiocommunication Bureau (BR) has participated in relevant meetings of ITU D Study Groups, Rapporteur Groups and TDAG, where liaison activities have involved topics such as spectrum management, digital broadcasting and migration from analogue systems, transition towards and implementation of IMT, and broadband

wireless access technologies. These topics are in addition to the collaboration undertaken through ITU D Question 9-3/2 that calls for the identification of study topics in ITU-R (and ITU T) considered of particular interest to developing countries.

101. The Radiocommunication Bureau (BR) organizes the [World Radiocommunication Seminars \(WRS\)](#) on spectrum management every two years, providing Member States with direct access to essential information, training, and tools. These seminars, along with their associated workshops, serve as a vital platform for capacity-building, offering practical guidance and technical expertise on spectrum management. The WRS strengthens national capabilities and promotes efficient, effective, harmonized spectrum use across regions through tailored training sessions, comprehensive information briefings, and the development of handbooks and digital tools. This capacity-building initiative supports Member States and fosters global cooperation in radiocommunications by providing access to key technical information and relevant knowledge resources.
102. In addition to the World Radiocommunication Seminars, the Radiocommunication Bureau (BR) organizes [Regional Seminars](#) to address the particular needs of developing countries. The Regional Seminars provide access to information and knowledge which directly supports Member States and promotes capacity-building. The Seminars are arranged to equitably cover all ITU Regions. To further support capacity-building, the BR also provides individual training upon request.
103. ITU-T launched a new [delegate training portal](#) to develop capacity to engage in telecommunication standardization activities for newcomers, experienced experts and standards leadership. The modules are intended to address the specific training requirements set out in WTSA Resolution 44 (Rev. New Delhi, 2024) on Bridging the standardization gap between developing and developed countries, Resolution 55 (Rev. New Delhi, 2024) on Mainstreaming gender equality in ITU Telecommunication Standardization Sector activities, and new Resolution 107 (New Delhi, 2024) on Enhancing the engagement of next-generation experts in the standardization activities of the ITU Telecommunication Standardization Sector.
104. ITU-T is working to equip countries around the world with the knowledge and tools necessary to take advantage of AI, with the aim of ensuring that its benefits are globally accessible and equitable. Through the AI for Good Impact initiative, which aims to scale impactful AI solutions and strengthen capacity-building efforts — particularly for developing countries — the AI Skills Coalition has been established as a transformative movement aimed at empowering individuals and communities with essential AI expertise. By providing access to high-quality AI training and creating a collaborative framework for partners to launch large-scale impact projects focused on AI capacity development, the Coalition seeks to bridge the AI divide and ensure inclusive participation in this technological revolution by supporting capacity and skill development for policymakers, regulators, industry leaders, professionals across the workforce, as well as the next generation of tech innovators. The initiative aims to deliver training on AI skills at scale for global and underserved communities (including woman and youth), with emphasis on developing countries. Will.i.am was

officially appointed as the Goodwill Ambassador for the Coalition during the AI for Good Global Summit in July 2025.

105. In 2025, ITU-T expanded this initiative with the launch of the Young AI Leaders Community, inviting young AI experts aged 18 to 30 to join or establish a hub within our six recognized regions. Created to foster a strong and diverse network of global AI leaders, the community has already established over 100 hubs across 50 countries and welcomed more than 650 members. Through this initiative, young people gain the skills, platforms, and support needed to lead the way toward a more inclusive and sustainable digital future by developing impactful AI projects at both local and global levels.
106. The AI for Good Impact initiative also includes flagship programmes such as the Global AI Challenges, the AI for Good Innovation Factory and Startup Acceleration Programme, and the Robotics for Good Youth Challenge, which engages young innovators worldwide and culminated in a global competition at the AI for Good Global Summit in 2025. These programmes, alongside the AI for Good Impact Report, underscore ITU's commitment to bridging the AI divide, fostering international partnerships, and supporting sustainable development goals through AI capacity building.
107. The AI for Good Impact Initiative also launched a new series of regional Impact events, including AI for Good Impact India, at the request of the Indian government. AI for Good Impact Africa, the next regional event, will take place on 31 October 2025 in partnership with AI Expo Africa in Johannesburg, South Africa, which is taking place from 29 to 31 October 2025.
108. ITU Europe is conducting a digital skills assessment for the elderly, following a request issued at the Regional Development Forum (RDF) for Europe, by the Ministry of Infrastructure and Energy of Albania. The objective of this assessment is to determine the digital skills needs of the elderly population in Albania. The project will develop a strategy for an intergenerational approach to capacity building. This will be accompanied by a detailed roll-out action plan specifying the activities to be implemented.

Action Line C5: Building Confidence and Security in the use of ICTs



Related to SDGs: SDG 1 (1.4), SDG 4 (4.1, 4.3, 4.5), SDGs 5 (5.b), SDGs 7 (7.1, 7.a, 7.b), SDG 8 (8.1), SDGs 9 (9.1, 9.c), 11.3, 11.b, 16.2, 17.8



109. A fundamental role of the ITU, as emphasized by WSIS, is to build confidence and security in the use of information and communication technologies.

110. The 20th Action Line C5 Facilitator Meeting was held on Thursday, 10 July 2025, 10:00-10:45 CEST. The theme of this year was “Building Trust in Cyberspace”. For more details on the sessions and the outcomes, please see [here](#).

111. The WSIS Prizes 2025 Winners for the Action Line C5 are: AI & Facial Recognition Powered Solution for Telecom SIM Subscriber Verification, India; and Anti Online Scam Operation Center: AOC, Thailand. Details of the projects are available [here](#).

112. Cybersecurity and Countering Spam Activities

- The Global Cybersecurity Agenda (GCA) provides a framework for international cooperation aimed at enhancing confidence and security in the information society. Resolution 130 (Rev. Bucharest, 2022) clearly endorses the GCA as the ITU-wide strategy on cybersecurity.
- The GCA is built upon five strategic pillars or work areas around which its work is organized: (i) Legal Measures, (ii) Technical and Procedural Measures, (iii) Organizational Structures, (iv) Capacity Building and (v) International Cooperation. Within ITU, the activities below, organized along the five pillars of the GCA, shows the complementary nature of existing ITU work programmes and facilitates the implementation of Telecommunication Development Bureau (BDT), Telecommunication Standardization Bureau (TSB) and Radiocommunication Bureau (BR) activities in this domain.

Legal Measures (SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 16 (16.2), SDG 17 (17.8))

113. As part of ITU-D Priority 5 of the Kigali Action Plan, and taking into account ITU-D Q 3/2, ITU has assisted Member States in understanding the legal aspects of cybersecurity through the [G5 Accelerator](#) and its [ITU Cybercrime Legislation Resources](#). ITU collaborates closely with partners such as the United Nations Office on Drugs and Crime (UNODC).

(ii) Technical and Procedural Measures (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

114. In order to identify cyberthreats and countermeasures to mitigate risks, ITU-T has developed Recommendations of security requirements, guidelines and specifications for ICT and IP-based systems. ITU-T also provides an international platform for the development of the protocols, systems and services that protect current and future networks. ITU-T’s work on secure communication services, reviews enhancements to security specifications for mobile end-to-end data communications and considers security requirements for web services and application protocols.

115. [ITU-T Study Group 17 \(SG17\)](#) is responsible for developing international standards to enhance confidence, security and trust in the use of Telecommunication/ICTs, in the context of an ever-growing attack surface and confronted with an unbalanced threat

landscape. Providing security by ICTs and ensuring security for ICTs are both major study areas for Study Group 17.

116. This comprehensive and transformative endeavour, which considers the increase of compliance requirements, and ongoing coordination within ITU-T and other SDOs, encompasses the following areas:

- o Security Model, Framework, Architecture and Lifecycle: This includes studies of cybersecurity, wholistic security approaches spanning development, deployment, and operation phases, managed security services, and security automation. In particular, it delves into both security models like zero trust for network infrastructure and at the same time supply chain security, especially concerning software.
- o Cybersecurity and Service: This includes adapting to the evolving threat landscape (targeted attacks and ransomware), understanding the characteristics of emerging malware types, addressing and managing cybersecurity incidents, identifying security requirements, core cybersecurity solutions, exchanging threat intelligence, combating spam, endpoint detection and response and developing new simulation and prediction capabilities. It also includes services and their organizations such as the development of cyber security centres, incident response teams (IRTs) and managed security services.
- o Security Management: This includes information security management, identity solutions and management, authentication mechanisms and telebiometrics, all stimulated by new and emerging security technologies.
- o End-device, Edge, Network, Cloud, and Application Security: This addresses security in the context of end-devices, edge, networks, cloud, applications, and services, which is of paramount importance. It includes endpoint security, smart devices and Internet of things (IoT) devices, networks ranging from IMT-2020/5G and beyond and IMT-2030/6G, intelligent transport system (ITS) security, which extends to vehicle-to-vehicle (V2X) communication and autonomous driving. Additionally, it covers multifaceted approaches of security for smart cities and communities, smart entities including smart grid, smart factory and e-health, industrial control systems (ICS), terrestrial-satellite and satellite-satellite network convergence, radionavigation satellite service (RNSS), automatic identification system (AIS), software-defined networking (SDN), network function virtualization (NFV), Internet Protocol television (IPTV), web services, over-the-top (OTT) platforms, metaverse, digital twin technology, cloud computing, in-network computing, big data analytics, and digital financial system (DFS).

117. SG17 held one meeting in April 2025 - where SG17 approved 13 new or revised Recommendations and established 40 [new standardization work items](#) on ICT security.

- o SG11 continues its studies on implementation of security measures on signalling level in order to cope with different types of attacks on existing ICT

infrastructure and services (e.g. OTP intercept, calls intercept, spoofing numbers, robocalls, etc.). Among the solutions to be implemented against such attacks is the use of digital public-key certificates (ITU-T X.509) for signing sensitive information in the signalling exchange which may guarantee the trustworthiness of the information and the caller/sender identity. In 2020 and further in 2022, ITU-T SG11 developed three key standards which define the way on how public-key certificates can be inserted into signalling exchange (ITU-T Q.3057, Q.3062 and Q.3063). Afterwards, SG11 developed several amendments to existing Recommendations which define extensions in SS7 and BICC signalling to support the calling line identification authentication in line with the approach defined in ITU-T Q.3063 (Amendment 2 to ITU-T Q.931, Amendment 6 to ITU-T Q.1902.3, Amendment 7 to ITU-T Q.763). Currently, SG11 is working on the draft Recommendation ITU-T Q.TSCA "Requirements for issuing End-Entity and Certification Authority certificates for enabling trustable signalling interconnection between network entities" which specifies the requirements for the verification of information elements in certificate signing requests. It becomes a fourth part of the ITU-T SG11 standards related to signalling security (ITU-T Q.3057, ITU-T Q.3062 and ITU-T Q.3063). In line with SG11 developments, ITU-T Study Group 2 (SG2), <https://itu.int/go/tsg2>, is developing registration authority assignment criteria to issue digital public certificates while ITU-T SG17 is in charge of ITU-T X.509 which defines public-key and attribute certificate frameworks. SG11 organized series of Webinars and Workshops to provide overview of existing signalling protocols and their security, as well as the way forward. On 17 November 2025, ITU hosts the ITU Workshop "Securing Telephone Networks: Toward a Collaborative Approach for Combating Fraudulent Communications Using Digital Certificates" (<https://itu.int/go/WS-STN>). More information is available on dedicated webpage at: <https://itu.int/go/SIG-SECURITY>.

118. **SG20** is also working on Security, privacy, trustworthiness, and identification of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C).
119. Among ITU-T SGs approved Recommendations and other texts in this reporting period, 37 texts are about security (https://www.itu.int/ITU-T/workprog/wp_search.aspx?isn_sp=8265&isn_status=-1,8,1,3,7,2&adf=2023-11-01&adt=2024-08-19&sum=security&details=0&field=acdefghijo) and 12 texts are about trust (https://www.itu.int/ITU-T/workprog/wp_search.aspx?isn_sp=8265&isn_status=-1,8,1,3,7,2&adf=2023-11-01&adt=2024-08-19&sum=trust&details=0&field=acdefghijo).
120. Use Cases driven by the information sharing platform. Several ITU-T focus groups, referenced on [this page](#), are also exploring the trust aspect of various emerging technologies as part of their work. For example, the Focus Group on metaverse (FG-MV) has approved 4 Technical Reports on issues such as Cyber risks, threats, and harms in the metaverse, and Embedding safety standards and user control of Personally Identifiable Information (PII) in the development of the metaverse.

121. The [Global Initiative on Virtual Worlds and AI – Discovering the Citiverse](#), launched by ITU, Digital Dubai, and UNICC, with the support of over 70 international partners, serves as a global platform that aims at fostering open, interoperable and innovative AI-powered virtual worlds that can be used safely. This initiative also works on security and trust in the citiverse and virtual worlds.
122. With the constant evolution of communication technologies, the work of the ITU Radiocommunication Sector (ITU-R) continues to build and maintain confidence and security in the use of ICTs. ITU-R established clear security principles for International Mobile Telecommunications (IMT) (3G, 4G and 5G) networks. The development of [IMT-2030](#) is expected to support expanded and new usage scenarios with enhanced capabilities. It is also anticipated that IMT-2030 will help address the need for increased environmental, social, and economic sustainability. These developments further build confidence and security in the use of ICTs.
123. BDT collaborates with Member States, partners, and global organizations to strengthen cybersecurity by creating national and regional CIRTs. Additionally, BDT conducts CIRT Maturity Assessments to further enhance their capabilities. So far, 85 countries have been assisted in evaluating their cybersecurity readiness, leading to the establishment or improvement of National CIRTs. ITU has implemented 24 CIRT-related projects and is currently working on five more.
124. ITU actively collaborates with the FIRST community to enhance the CSIRT Service Framework and revise training materials for capacity-building in managing national CIRT operations.
125. To ensure that the national CIRTs apply good practices to respond to cybersecurity incidents and foster technical cooperation among national CIRTs, CyberDrills are organized at a regional and intra-regional level. In recent years, BDT has conducted over 55 international, regional or national exercises (including 3 Global CyberDrills) involving more than 160 countries from all the six ITU regions.
126. Through cybersecurity exercises the ITU Member States build capacity that promotes readiness, protection, and better incident response. The ITU CyberDrills serve a dual purpose: provide a platform for cooperation, information sharing, discussions on current cybersecurity issues, and be a platform for capacity building through hands-on exercises and focused training workshops for the national Computer Incident Response Teams.
127. Under the Cyber for Good initiative, ITU-D Sector Members CTM360, Dreamlab Technologies, ImmuniWeb, NRD Cyber Security, and RealTyme have been offering tools and services to support countries in their cybersecurity efforts.

(iii) Organizational Structures (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

128. The BDTs work on NCS focuses on supporting countries in developing and/or improving their cybersecurity strategies through direct assistance, in-country

activities, including providing expertise, training, and capacity-building resources. ITU has built on the [Second edition of The Guide to Developing a National Cybersecurity Strategy](#) (NCS), published in 2021 in collaboration with over 20 international partners, and is working with several countries and territories to advance their cybersecurity strategies through in-person table top exercises and Action Plan assessments in collaboration with the United Kingdom. ITU, in conjunction with stakeholders, is in the process of updating The Guide to Developing a National Cybersecurity Strategy which is expected to launch in Q4, 2025. In 2023, BDT has re-launched online self-paced training on NCS in [English](#), [French](#), [Spanish](#) and [Russian](#) that covers best practices for developing and implementing National Cybersecurity Strategies which are delivered on [ITU Academy Platform](#). We believe that this self-paced training, proved to be useful course to a significant number of professionals from various countries that have successfully completed the training. (Trainings were utilized by about 750 professionals in 139 countries).

ITU also delivered NCS tabletop exercises (TTX ²) on the development and implementation of NCS in two countries and run similarly consultation workshops³ on national level to validate drafted NCS objectives of the respective countries. In each country, there were between 35 to 45 participants from different national stakeholder groups representing various organizations, and they actively engaged in these TTX sessions and consultation workshops. BDT in partnership with the United Kingdom team worked to deliver a Joint Integrated Cybersecurity Assessment Project ([JICAP](#)) aimed to facilitate and support national efforts for two (2) countries in developing/reviewing their NCS and NCS Action Plans. In addition, BDT has assisted other five (5) countries in the assessment of their current cybersecurity strategies and provided suggestions to improve since last study group meeting.

129. Under the Cyber for Good initiative, ITU-D Sector Member Axon Consulting has worked with LDCs to review their NCS.

(iv) Capacity Building (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

130. BDT continues to organize regional cybersecurity forums for all ITU regions, using them as a capacity-building vehicle for different BDT programmes and activities as well as an operational platform for cooperation at the regional and international level.

131. The fifth edition of the [ITU Global Cybersecurity Index](#) (GCI) Questionnaire was released in 2025. The edition of the index covers 193 Member States and the State of

² TTX Session Country Communication: <https://www.dgssi.gov.ma/fr/content/exercice-d-elaboration-d-une-strategie-nationale-de-cybersecurite.html>

³ Consultation Workshop Country Communication: <https://www.dgssi.gov.ma/fr/content/ateliers-debats-autour-des-nouveaux-objectifs-strategiques-nationaux-en-matiere-de-cybersecurite.html>

Palestine. The fifth edition features revisions to the Questionnaire by the 140+ member Expert Group, and a shift from ranks to tiers in presentation of the scores.

132. To promote the involvement of young people in the field of cybersecurity and to raise awareness on the field's worldwide workforce shortage, ITU is planning activities and collaborations for and by youth under the umbrella of the Generation Connect Initiative.
133. The Her CyberTracks initiative is a three-part project incorporating online and on-site technical trainings in cybersecurity policy and diplomacy, soft skills trainings, guided monthly mentorship circles, inspirational keynotes, as well as regional networking events – all made available as a complementary and one-stop holistic curriculum under three tracks: Policy & Diplomacy, Incident Response, and Cybercrimes Track. The Her CyberTracks Project aims to promote the equal, full, and meaningful representation of women in cybersecurity for a more resilient cyberspace for all. The project builds on ITU's ongoing efforts to bridge the gender digital divide, including the Women in Cyber Mentorship Programme. The objective of the Project is to promote the representation and participation of women seeking to improve their contribution to national and international cybersecurity policy processes. Her CyberTracks is co-implemented with GIZ, UNODC, and LAC4, with support from the European Union, Global Gateway, German Federal Foreign Office, and Microsoft. Geographic reach for 2025 has expanded to include all African Union members, in addition to 5 countries from the Americas (in cooperation with OAS) and previously targeted countries in Europe.
134. [The Cyber for Good](#) project aims to narrow the cyber capacity gap by promoting the inclusion of women and youth, and enhancing cybersecurity within and between nations, focusing on LDCs and developing countries. Since its start in 2022, ITU is working with more than 30 LDCs and SIDS. Collaborating with ITU-D Sector Members, particularly cybersecurity providers and experts, the BDT strives to offer free tools, advice, and training to LDCs, ensuring low barriers for engagement. Currently, eight ITU-D Sector Members have pledged in-kind contributions to partner with BDT, benefiting several LDCs.

(v) International Cooperation (SDG 1 (1.4), SDG 7 (7.1, 7.a, 7.b), SDG 9 (9.1, 9.c), SDG 11 (11.3, 11.b), SDG 17 (17.8))

135. ITU has relationships and partnerships with various regional/international organizations and initiatives, 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.
136. Pursuant to Decision 630 (Council 2023), ITU developed an informational resource to help Member States build their cybersecurity and cyber resilience capacity, and has invited Member States and other stakeholders to contribute best practices, resources and related information for this purpose.

137. ITU has continued to engage with stakeholders in Open-ended Working Group on security of and in the use of ICTs (OEWG), which concluded in July 2025. ITU provided inputs into its capacity development mapping exercise, understanding current cybersecurity needs based on the Global Cybersecurity Index, showcasing the impact of the HerCyberTracks initiative, and the ITU-OAS Systems approach to understanding national cybersecurity education capacity.
138. In collaboration with the Organization of American States (OAS) Cybersecurity Program, the BDT Cybersecurity Division is actively engaged in the creation of capacity development instruments designed to assist nations in adopting a systems-based approach to cybersecurity education, ultimately contributing workforce development. Building upon the framework developed , ITU intends to make these resources accessible in additional regions while simultaneously exploring potential synergies with other regional organizations for the deployment of the tools within their respective territories.
139. In November 2024, ITU also launched the [International Advisory Body on Submarine Cable Resilience](#) in partnership with the International Cable Protection Committee (ICPC), comprising 40 leaders and experts from the public and private sectors, with the aim of promoting dialogue and collaboration on potential ways and means to improve the resilience of this vital infrastructure that powers global communications and the digital economy. The first in-person meeting of the Body took place at the [International Submarine Cable Resilience Summit 2025 \(Abuja, Nigeria, 26-27 February 2025\)](#) that brought together governments, industry leaders, and international organizations to address critical challenges facing submarine cables.
140. ITU is collaborating with Member States to deliver its work, notably the Czech Republic, Germany, the Kingdom of Saudi Arabia, and the United Kingdom.

(vi) The Child Online Protection (COP) Global Initiative (SDG 4 (4.1, 4.5) and SDG 16 (16.2))

141. Within the framework of the GCA, the Child Online Protection (COP) Initiative was established by ITU as an international collaborative network for action to promote the online protection of children worldwide.
142. ITU has been raising awareness on COP issues and building capacity through organizing workshops, strategic dialogues and regional forums, holding several workshops at different international conferences and leading or participating in different projects.
143. As of April 2025, ITU has supported the development of national COP frameworks or related assessments in 13 countries: Albania, Armenia, Bahamas, Bhutan, Bolivia, Ecuador, Kazakhstan, Malawi, Mongolia, Pakistan, Peru, Suriname, and Thailand. Further policy assistance is being undertaken in Andorra, Eswatini, and Lebanon. These frameworks embed legal and regulatory measures that align with international standards and national child protection priorities.

144. Practical tools and digital learning resources have been central to ITU's work on child online protection. To support national integration of child protection principles, 26 countries have translated the ITU COP Guidelines into local languages, including recent localisations into Quechua (Ecuador), Aymara (Bolivia), Dutch (Suriname), and Maltese during 2024–2025.
145. Ten online self-paced training courses were developed and made available through the ITU Academy, including a sector-specific course for the ICT industry launched in 2024 in partnership with UNICEF. In parallel, online trainings for children—tailored to three different age groups and co-developed with children—were released on Safer Internet Day 2025 in all six official UN languages.
146. Additional awareness raising materials, including brochures and educational videos, were developed and deployed in countries such as in 2025 in Morocco to support national awareness raising campaigns. ITU further supported the roll-out of the COP Guidelines in Serbia in February 2024. Activities included a dissemination campaign and the presentation of newly translated materials in the national language. The campaign successfully reached 957 children, along with 60 teachers, pedagogues, and psychologists.
147. Significant efforts have been made to empower key stakeholders in the field of child online protection through capacity building programmes. A total of around 170,000 children have participated in educational and empowerment activities focused on online safety, while 2,500 parents and educators and 1,000 government stakeholders have received training through workshops, Training of Trainers (ToT) sessions, and e-learning programmes. These capacity-building efforts have been implemented across all ITU regions, with ToT programmes conducted in countries such as the Bahamas, Costa Rica, Ecuador, Kyrgyzstan, Maldives, Malawi, Malta, Micronesia, Morocco, and Suriname. Additional country-level efforts have further expanded the reach of COP capacity-building. In Ecuador, in collaboration with the Scott Foundation and in the context of ITU's broader efforts, a training webinar was held for young sports coaches to raise awareness on child online protection in sports contexts. Furthermore, training sessions were conducted for policymakers, the ICT industry, and civil society actors in Ecuador.
148. Intersectoral cooperation remains central to the implementation of Child Online Protection (COP), with ITU leading efforts to foster intersectoral collaboration and evidence-based policy development. The Protection through Online Participation (PoP) initiative, co-led by ITU and the UN Special Representative of the Secretary-General on Violence Against Children, brings together over 30 partners from across the UN system, technology platforms, civil society organizations, and academia. The initiative is developing guiding principles for policymakers, child helplines, and technology platforms, which are scheduled for release in 2025. In parallel, ITU is collaborating with the Committee on the Rights of the Child, UNICEF, and more than ten co-signatory agencies to finalize an interagency Joint Statement on Artificial Intelligence and child online protection, expected to be adopted by the Committee in 2025.

149. In terms of Research and Innovation, findings emerging from the PoP initiative—including engagement with child helplines, digital platforms and service providers, and children and young people—has highlighted the dual nature of digital environments as spaces of potential harm and critical channels for accessing support services. These insights are shaping a shift toward a more empowering and preventive approach to online child protection. In addition, ITU has launched a global research collaboration with the World Health Organization (WHO) in late 2024 to establish a Global Online Safety Prevention Education and Resource Network. Recognizing the importance of child participation, throughout 2024 and 2025, ITU has enabled the creation of child taskforces in Indonesia, Malawi, and Lebanon, enabling children to contribute directly to the development of national COP strategies.
150. Together with the Office of the UN Special Representative of the Secretary General on Violence Against Children, and selected partners, ITU started an initiative on Protection through online participation (POP), aiming at providing recommendations to all relevant stakeholder groups based on a global mapping of the current ways that children and young people use the digital environment to access protection services, support each other, and stay safer, both online and offline, and to better understand the effectiveness of these systems.

Action Line C6: Enabling Environment



Related to SDGs: SDG 1 (1.4), SDG 4 (4.1, 4.3, 4.5), SDGs 5 (5.b), SDGs 7 (7.1, 7.a, 7.b), SDG 8 (8.1), SDGs 9 (9.1, 9.c), 11.3, 11.b, 16.2, 17.8



151. Recognizing the strong commitment of ITU's work towards bridging the digital divide in the area of the enabling an ICT policy and regulatory environment, ITU continuous leading the facilitation role on WSIS Action Line C6 Enabling Environment as the sole facilitator building upon its regular work carried out within the framework of the ITU-D Priority 3: Enabling Policy and Regulatory Environment Promoting an enabling policy and regulatory environment conducive to sustainable telecommunication/ICT.
152. The 20th Action Line C6 Facilitation Meeting was held as an integral component of the WSIS+20 High-Level Event 2025, on Tuesday, 28 May 2024. The theme of this year was: "Digital Ecosystem Builders in action: Redefining the role of ICT regulators". For more details on the sessions and the outcomes, please see [here](#).
153. The WSIS Prizes 2025 Winner for the Action Line C6 is: Digitech, South Africa. Details of the project are available [here](#).
154. ITU has undertaken numerous activities that foster the development of an enabling environment worldwide including High Level Exchange Platforms on ICT Policy and Regulation for Digital transformation, ICT Policy and Regulation Data and Knowledge

Platforms for evidence-based decision making, and support for the development and strengthening of ICT Policy and Regulatory Frameworks and Capacity Development. The main purpose is to provide the platforms and tools for effective policy, legal and regulatory frameworks to support regulators and policymakers in driving inclusive and cross-sectoral collaboration.

155. ITU-D provides knowledge exchange tools and platforms to enable inclusive dialogue and enhanced cooperation to help countries leap forward and achieve a more inclusive digital society and to raise national and regional awareness about the importance of an enabling environment for digital transformation.
156. In the frame of knowledge exchange tools and platforms the annual Global Symposium for Regulators (GSR) provides a neutral platform for ITU members to share their views on major issues facing the ICT sector and concludes with the adoption by regulators of a set of regulatory GSR Best Practice Guidelines.
157. The 23rd edition of the [Global Symposium for Regulators \(GSR-24\)](#) was held in Kampala, Uganda, from 1 to 4 June 2024, and attracted 600 participants including Government Ministers and Deputy Ministers (10), Heads of Regulatory Authorities and C-level industry executives (50+) from over 77 countries. GSR-24 was chaired by Mr William Nyombi Thembo, Executive Director, Uganda Communications Commission (UCC), under the theme “Regulation for impact”.
158. Throughout the GSR programme, discussions focused on maximizing digital opportunities, the space economy, universal connectivity, digital transformation, Artificial Intelligence (AI) and robotics for positive impact, safe and inclusive digital financial services, agile regulation, and digital for climate action. The GSR-24 Chairman's report is available at: www.itu.int/gsr24.
159. A series of special events took place on 1 July, including the Regional Regulatory Associations (RA) and Digital Regulation Network (DRN) meeting and the Heads of Regulators' Executive Roundtable. The Industry Advisory Group on Development Issues and Private Sector Chief Regulatory Officers (IAGDI-CRO) convened on 2 July. A session of Network of Women (NoW) in ITU's Telecommunication Development Sector on 3 July explored mechanisms for greater participation of women in ICT-related fields and addressed the leadership gender gap in the ICT sector. A technology exhibition was held from 1-4 July showcasing the latest digital innovative technologies and applications from international and local ICT companies. Regulators from around the world identified and endorsed the GSR-24 Best Practice Guidelines on "Helping chart the course of transformative technologies for impact". These Guidelines can help ICT regulators shape a regulatory environment that enables the rollout of cutting-edge infrastructure to support digital societies and digital economies of the future. The Guidelines also identify measures to minimize risk and maximize inclusive social and economic benefits of transformative technologies. The guidelines can be found on the GSR-24 website at: www.itu.int/gsr24.

160. The Network of Women in Standards (NoW in ITU-T) continued to foster an enabling environment for gender-inclusive participation in technical standardization. Through targeted leadership development, regional engagement, and awareness-raising activities. The gender equality campaign for the World Telecommunication Standardization Assembly 2024 (WTSA-24) contributed to a 25% increase in women appointed to leadership roles in ITU-T. In 2025, events such as networking breakfasts convening female and male standard experts reaffirmed collective commitment to inclusivity, while high-level sessions at the AI for Good Global Summit 2025 brought together women leaders in AI and standards to advocate for greater representation and leadership opportunities. A targeted survey to ITU-T membership identified key barriers to women's participation in standardization and informed recommendations to strengthen gender balance in technical work. These initiatives advanced mentorship, collaboration, and awareness, contributing to a more equitable standardization ecosystem.
161. The [Digital Regulation Network \(DRN\)](#), a new BDT initiative launched at GSR-23, identifies common approaches to collaborative digital policy, regulation, and governance across economic sectors and across borders. The Network is enabled by Regulatory Associations (RAs) at the regional and global level by leveraging South-South, North-South and triangular cooperation. Over the past year, DRN facilitated the active participation of RAs in capacity building workshops, shared digital regulation materials, and called for twinning opportunities to learn from other Regional Regulatory Associations (RAs). Future activities will continue to focus on capacity building, collaborative regulation, twinning, and participation in ITU-D Study Group activities.
162. ITU-D provides Membership with innovative tools and assistance to help countries leap forward.
- ITU has led the research and analysis on collaborative regulation while at the same time building a global community around it – it is a community-owned programme of work. A series of collaborative digital regulation country reviews (Brazil, Colombia, Egypt, Nigeria, and Kenya) articulate the benefits of G5 regulation at country level, and anchors these benefits in experience and evidence.
 - The [2023 edition of the G5 Benchmark](#) provided an assessment of the state of readiness of national policy, legal and governance frameworks for digital transformation. The new visualization tools on the [G5 Accelerator platform](#) allow for a customized analysis and deep dive into the data on 54 indicators by region or country.
 - The analytical companion of the 2023 G5 Benchmark dataset, the technical paper 'Benchmark for fifth generation collaborative digital regulation 2023: global and regional trends', highlights trends in the evolution of national legal, policy and governance frameworks for digital transformation across regions and groups of vulnerable countries (LDCs, LLDCs and SIDS).

- [Econometric research and analysis](#) include studies and recommendations on affordability for ICT adoption across the globe. A series of expert reports quantified the positive economic impact of broadband, digital transformation and the interplay of ICT regulation both at regional and global levels.
 - The [ITU World Bank Digital regulation platform](#) provides the latest information on developments of regulation strategies, best practices, and case studies. The thematic sections, regularly updated, tackle new regulatory aspects and tools to consider when making regulatory decisions to harness the benefits of the digital economy and society. The latest articles include the following: National digital transformation strategy – mapping the digital journey; Guiding principles for ICT regulators to enhance cyber resilience; Transformative technologies (AI) challenges and principles of regulation; and Regulation of NGSO Satellite Constellations.
 - In February, with the support of Government of the United Kingdom Foreign, Commonwealth & Development Office (FCDO) Digital Access Programme (DAP), the Efficiency toolkit was developed by ITU as a practical guide for countries looking to achieve impactful and sustainable universal access and service implementation. This toolkit helps to navigate the multitude of business models that need financial support in order to have a local, municipal and national impact, as well as to meet SDGs and related targets. The online self-paced course developed to better understand how to use the toolkit is available through the ITU Academy, and being translated in other languages. Face-to-face facilitated training to national stakeholders on the toolkit modules have also been delivered in Indonesia by end of 2023 and to CRASA members in 2024.
163. ITU-D provides training and capacity development for regulators and other stakeholders to address digital policy, regulation as well as economic and market developments and collaborative regulatory approaches for digital transformation.
164. ITU is developing training materials for regulators as part of the [Digital Regulation platform](#) and providing training with partners, such as EaPeReg, EMERG. Globally, two ITU global digital regulation training courses were delivered (with financial support from CST Saudi Arabia) on effective policy, legal, and regulatory frameworks for 910 participants from 134 countries, among which 310 received a certificate.
165. The IMDA Executive Training, held in Singapore from 19 to 25 September 2023, highlighted the commitment to digital transformation in small States, aligning with the Partner2Connect Digital Coalition (P2C) initiative and benefiting members globally. The training built the capacity of policy-makers and regulators from small states in digital regulation and included 19 participants.
166. ICT infrastructure is the basis of today's digital economy and offers enormous potential to advance progress towards the UN Sustainable Development Goals (SDG) and improve people's lives in fundamental ways. Deploying broadband in big towns and cities happens almost naturally. But deploying these networks to rural and remote areas is markedly more challenging. ITU developed the [ICT Infrastructure](#)

[Business Planning toolkit](#), training series and self-paced training to support regulators in designing optimal broadband network that can respond and adapt to a wide range of infrastructure deployment projects for 5G technologies and satellite.

167. **ITU-D Study Groups** examine specific task-oriented telecommunication/ICT questions of priority to developing countries, to support them in achieving their development goals and SDG targets. The mandate of [ITU-D Study Group 1](#), relevant to Action Line C6 covers [questions](#) on "Enabling environment for meaningful connectivity", including: a) Strategies and policies for the deployment of broadband in developing countries, b) Economic aspects of national telecommunications/ICTs, c) Telecommunications/ICTs for rural and remote areas, with special focus on developing countries, including least developed countries, small island developing states, landlocked developing countries and countries with economies in transition, d) Telecommunication/ICT accessibility to enable inclusive communication, especially for persons with disabilities, e) Strategies, policies, regulations and methods of migration to and adoption of digital technologies for broadcasting, including to provide new services for various environments, f) Use of telecommunications/ICTs for disaster risk reduction and management, particularly in developing countries, and g) Consumer information, protection and rights for telecommunication/ICT services, especially for vulnerable groups.
168. Outputs agreed on in the ITU-D Study Groups, and related reference material, are used as input for the implementation of policies, strategies, projects and special initiatives in Member States. These activities also serve to strengthen the shared knowledge base of the membership. (www.itu.int/itu-d/sites/studygroups/).
169. Additional details about other activities implemented by BDT can be found at the ITU-D Policy and Regulation website: www.itu.int/itu-d/sites/regulatory-market/.
170. International mobile roaming remains an important area of work for ITU-T SG3 through its work in Question 7/3. SG3 published the following technical reports on the topic: [DSTR-IoTM2M-Roaming - Roaming aspects of IoT and M2M including any related development and tariff principles](#) and [DSTR-ROAMREG - Regional roaming initiatives](#). SG3 also published an African regional [Recommendation ITU-T D.607R](#) "One network area roaming".
171. ITU also provides support, assistance and training to developing countries with the aim of bridging the standardization gap (BSG) on ICT technologies. ITU-T has 26 Regional Groups to stimulate effective participation in ITU-T Study Groups and increase the number of quality Contributions from the various regions - eight in Africa, five in the Americas, five in the Arab region, three in the APT region, four in Eastern Europe, Central Asia and Transcaucasia, and one in Europe. ITU-T also continues to offer a mentoring programme for new delegates to ITU-T study groups. Remote participation is offered during all study group meetings and closing plenaries benefit from full interpretation.
172. ITU organizes annual Regional ICT Standardization Forums as part of activities under WTSA Resolution 44 on bridging the standardization gap. The Forums discuss current

standardization topical issues in ITU-T study groups and focus groups to engage more developing countries in the standardization work and could also feature capacity building on ITU-T Recommendations. Regular BSG trainings are also organized in collocation with study group and regional group meetings in order to equip delegates from developing countries with right skills to contribute to the standards development process at the ITU.

173. ITU-T study groups developed the following Recommendations and other texts on the network aspects of IMT-2020:

- [ITU-T Y.3061 “Autonomous Networks - Architecture framework”](#) provides requirements, architecture, components and related sequence diagrams which together comprise an architecture framework for autonomous networks. The scope of this Recommendation includes: Requirements for the architecture; Description of the architecture and its components; Sequence diagrams explaining the interactions between the architecture components.
- **ITU-T Y.3062 “Trustworthiness Evaluation for IMT-2020 and Beyond with Autonomous Network Functions” (under approval)** specifies trustworthiness evaluation for IMT-2020 and beyond which are equipped with autonomous network (AN) functions. It includes the overview of trustworthiness, evaluation process for trustworthiness, evaluation metrics and related sub-metrics for trustworthiness, quantitative ways for trustworthiness in trust in AN (TiAN).
- **ITU-T Y.3084 “Information-centric networking in networks beyond IMT-2020: Requirements and functional framework to support immersive live experience services” (under approval)** specifies the requirements, functions, scenarios and security considerations of information-centric networking (ICN) to support immersive live experience services in networks beyond IMT-2020.
- **ITU-T Y.3085 “Information-centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support deterministic communication services” (under approval)** specifies the requirements and functional framework for enhanced information-centric networking (ICN) to support deterministic communication services in networks beyond IMT-2020.
- **ITU-T Y.3086 “Information-centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support machine learning” (under approval)** specifies the requirements, functions, and scenarios of information-centric networking (ICN) to support machine learning services in networks beyond IMT-2020.
- **ITU-T Y.3092 “Digital twin for management and orchestration in IMT-2020 networks and beyond” (under approval)** describes how digital twins facilitate management and orchestration in IMT-2020 networks and beyond. It specifies the requirements, framework, and interfaces of network digital twins, as well

as the considerations for data collection. It also outlines the necessities and values of IMT-2020 networks and beyond.

- [ITU-T Y.3124 “Quality of service monitoring requirements and framework for IMT-2020 and beyond”](#) specifies the quality of service (QoS) monitoring requirements and framework for IMT-2020 and beyond. It first provides an introduction of QoS monitoring for IMT-2020 and beyond. The QoS monitoring requirements and framework are specified accordingly.
- [ITU-T Y.3125 “QoS assurance requirements and framework for cloud gaming supported by IMT-2020 network”](#) specifies the QoS assurance aspects for cloud gaming supported by the international mobile telecommunications 2020 (IMT-2020) network. It first provides an overview of the cloud gaming supported by IMT-2020 network. It then specifies the high level requirements, functional requirements, and framework for cloud gaming supported by IMT-2020 network.
- [ITU-T Y.3126 “QoS requirements and framework of interworking capability for supporting deterministic communication services in local area network for IMT-2020 and beyond”](#): Interworking capability is an essential function to support QoS-guaranteed data transmission across heterogeneous networks. The data transmission of deterministic communication service in local network usually involves in multiple technology domains. In order to provide efficient QoS guarantee for deterministic communication services in heterogeneous technology domains, this Recommendation defines three types of interworking capability and specifies QoS assurance requirements, framework instances and operational procedures of interworking capabilities, based on the models defined in [ITU-T Y.3121].
- [ITU-T Y.3127 “Future networks including IMT-2020 - Requirements and framework for self-organizing core network”](#): The self-organizing core network is a core network constituted by a group of self-organized network entities cooperating to provide core network functions based on the available network capabilities and resources. It may reduce the Capital Expenditure and Operating Expense of core network by efficiently utilizing available network capabilities and resources. This Recommendation specifies overview, requirements, framework and general procedures of self-organizing core network, in the context of future networks including IMT-2020.
- [ITU-T Y.3128 “QoS assurance requirements and framework for cloud gaming supported by IMT-2020 network”](#) specifies requirements for network function communication between public networks (PNs) and public network integrated non-public networks (NPNs) in IMT-2020. These requirements build on the analysis of relevant use cases and related network problems. There are two types of NPN: public network integrated non-public network; and stand-alone non-public network. The requirements specified in this Recommendation concern the first type.

- [ITU-T Y.3129 “Requirements and framework for stateless fair queuing in large scale networks including IMT-2020 and beyond”](#) specifies the requirements and framework for deterministic networking with a set of work conserving packet schedulers that guarantees end-to-end (E2E) latency bounds to flows. The schedulers in core nodes do not need to maintain flow states. Instead, the entrance node of a flow marks an ideal service completion time according to a fluid model, called Finish Time (FT), of a packet in the packet header.
- [ITU-T Y.3141 “Energy efficiency management of virtual resources in IMT-2020 networks and beyond”](#) covers the following aspects: Functional requirements of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Architectural model of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Reference points of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Procedures of energy efficiency management of virtual resources in IMT-2020 networks and beyond.
- [ITU-T Y.3142 “Requirements and framework for AI/ML-based network design optimization in future networks including IMT-2020”](#) focuses on using AI/ML to improve network design mechanisms, which deals with how to integrate AI/ML in order to optimize the design of network capacity, network topology, and routing for satisfying all the demands’ SLAs in a cost-effective way, instead of only guaranteeing the SLAs without taking into account the overall cost.
- **ITU-T Y.3143 “Quality of service assurance requirements and framework for smart healthcare supported by IMT-2020 and beyond” (under approval)** specifies the quality of service (QoS) assurance requirements and framework for the smart healthcare supported by the international mobile telecommunications 2020 (IMT-2020) and beyond. It first provides an overview of smart healthcare supported by IMT2020 and beyond. The QoS considerations for smart healthcare supported by IMT2020 and beyond are described. The specification of the QoS assurance requirements and a framework to reflect the identified QoS considerations is followed. Finally, the smart healthcare application scenarios with QoS metrics extended from the requirements are described in Appendix I.
- **ITU-T Y.3144 “Future networks including IMT-2020 - Requirements and functional architecture of distributed core network” (under approval):** The distributed core network is a core network which builds on network functional units collaborating in a distributed manner to provide the network functions of control plane, user plane, and data plane. This Recommendation specifies the enabling features, requirements, functional architecture, network function enhancements and procedures of distributed core network, in the context of future networks including IMT-2020.
- [ITU-T Y.3159 “Framework for classifying network slice level in future networks including IMT-2020”](#): The objective of this Recommendation is to specify a

framework for classifying network slice level in future networks including IMT-2020. This framework guides the network slice deployment and management. A method for classifying network slice level of future networks including IMT-2020 is introduced.

- [ITU-T Y.3161 “Intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond”](#): The objective of this Recommendation is to specify a intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond. This architecture guides the network slice deployment and management based on intent-based network.
- [ITU-T Y.3162 “Evaluating intelligence capability for network slice management and orchestration in IMT-2020 network and beyond”](#): As a novel technology of IMT-2020 network and beyond, network slicing allows the creation of multiple virtual networks on top of a shared physical infrastructure and meets diverse needs of users and applications. Meanwhile, Artificial Intelligence (AI) makes it intelligent especially by empowering network slice management and orchestration. This Recommendation aims to evaluate the intelligence level for network slice management and orchestration in IMT-2020 network and beyond and mainly covers the following aspects: overview, intelligence level definition, evaluation methods, framework and procedures of intelligent network slice management and orchestration.
- **ITU-T Y.3163 “Network accelerating for edge computing in IMT-2020 networks and beyond” (under approval)** clarifies the requirements, architecture, reference points and information flows for network accelerating for edge computing in IMT-2020 networks and beyond.
- **ITU-T Y.3164 “Requirement of joint development and operation for IMT-2020 and beyond” (under approval)**: Network softwarization brings forward the requirements of fast update, fast iteration and fast delivery for networks. By establishing a general joint development and operation pipeline tailored for communication operations management between network operators and network software providers, continuous delivery, continuous integration, continuous testing, and continuous deployment of related software systems can be achieved. This Recommendation specifies requirements of joint development and operation for IMT-2020 networks and beyond.
- [ITU-T Y.3186 “Requirements and framework for distributed joint learning to enable machine learning in future networks including IMT-2020”](#) specifies scenarios, requirements, framework and flow diagram for distributed joint learning to enable machine learning in future networks including IMT-2020. The Recommendation can help to realize a highly automated, intelligent, and multi-party collaborative network.

- **ITU-T Y.3187 “Architectural Framework for Machine learning function orchestrator in future networks including IMT-2020” (under approval)** provides an architectural framework for Machine Learning Function Orchestrator (MLFO) in future networks including IMT-2020. More precisely, it describes high-level requirements and high-level architecture of MLFO in future networks including IMT-2020.
- [ITU-T Y.3204 “Fixed, mobile and satellite convergence - Service continuity for IMT-2020 networks and beyond”](#): The service continuity is the ability for a moving object to maintain ongoing service over including current states, such as user's network environment and session for a service. Fixed, mobile and satellite convergence (FMSC) is the capability that provides services and applications to end users regardless of the fixed, mobile or satellite access technologies. This Recommendation specifies the scenarios, requirements, enablers, network function enhancements, procedures and security considerations of service continuity for FMSC, in the context of IMT-2020 networks and beyond.
- [ITU-T Y.3205 “Fixed, mobile and satellite convergence - Requirements of integrated user-centric service units”](#): An integrated user-centric service unit (IUSU) supports end users to define network and service capability profiles according to their own necessities. Fixed, mobile and satellite convergence (FMSC) is the capability of IUSU in supporting multiple access technologies used by various devices. This Recommendation specifies the scenarios, general characteristics, requirements, framework and security considerations of IUSU for FMSC, in the context of IMT-2020 networks and beyond.
- [ITU-T Y.3206 “Fixed, mobile and satellite convergence - Capability exposure for IMT-2020 networks and beyond”](#): The capability exposure provides functionalities for network functions to expose their capabilities to third parties (e.g. users or other operators). Fixed, mobile and satellite convergence (FMSC) is the capability that provides services and applications to end users regardless of the fixed, mobile or satellite access technologies. This Recommendation specifies the scenarios, requirements, reference points, network function enhancements, procedures and security considerations of capability exposure for FMSC, in the context of IMT-2020 networks and beyond.
- [ITU-T Y.3207 “Fixed, mobile and satellite convergence - Integrated network control architecture framework for IMT-2020 networks and beyond”](#) specifies the integrated network control architecture framework for fixed, mobile and satellite convergence (FMSC) in the control plane for IMT-2020 networks and beyond. It describes the scenarios and architecture frameworks of integrated network control system and individual network domain control system. It describes the procedures for the design and orchestration of end-to-end network services, and the performance monitoring and resource control in a unified manner of both terrestrial and non-terrestrial network domains.

- **ITU-T Y.3208 “Fixed, mobile and satellite convergence - Session management with satellite backhaul for IMT-2020 networks and beyond” (under approval):** Fixed, mobile and satellite convergence (FMSC) is the capability that provides services and applications to end users regardless of the fixed, mobile, or satellite access technologies. This Recommendation specifies the session management requirements, framework, procedures, and security considerations for the FMSC with satellite backhaul in the IMT-2020 networks and beyond.
- **ITU-T Y.3209 “Fixed, mobile and satellite convergence - Traffic scheduling for IMT-2020 networks and beyond” (under approval)** aims to describe the traffic scheduling for FMSC in IMT-2020 networks and beyond, including the scenarios, requirements, framework, network function enhancements and procedures.
- **ITU-T Y.3212 “Fixed, mobile and satellite convergence - Requirements of supporting High Altitude Platform for IMT-2020 networks and beyond” (under approval)** specifies the requirements of supporting HAP for FMSC for IMT-2020 networks and beyond, focusing on scenarios, requirements, and security considerations.
- **ITU-T Y.3213 “Fixed, mobile and satellite convergence - Policy control for IMT-2020 and beyond” (under approval)** specifies the policy control in FMSC network for IMT-2020 and beyond, focusing on scenarios, requirements, network function enhancements, reference points, procedures and security considerations.
- **ITU-T Y.3214 “Fixed, mobile and satellite convergence - Service function chain (SFC) for IMT-2020 networks and beyond” (under approval):** In SFC an ordered set of abstract service functions are defined with ordering constraints that must be applied to packets and/or frames and/or flows selected as a result of classification and/or policy, [ITU-T X.1045]. This Recommendation aims to describe the service function chain (SFC) in fixed, mobile and satellite convergence (FMSC) in IMT-2020 networks and beyond. It covers overview on SFC, requirements of SFC, SFC modification, network function enhancements for SFC, and security considerations in FMSC.
- **ITU-T Y.3215 “Fixed, mobile and satellite convergence - Requirement of network sharing for IMT-2020 networks and beyond” (under approval)** specifies high-level requirement and functional requirement of network sharing for fixed, mobile and satellite convergence networks.
- **ITU-T Y.3216 “Fixed, mobile and satellite convergence - Distributed core network for IMT-2020 networks and beyond” (under approval)** specifies the general considerations, requirements, network function enhancements, procedures and security considerations of distributed core network in FMSC network, in the context of IMT-2020 and beyond.

- [ITU-T Y.3400 “Coordination of networking and computing in IMT-2020 networks and beyond - Requirements”](#): The emergence of new services puts forward the need for the support of critical service requirements on computing, networking and storage resources at the same time. The coordination among resources of the same or different types (computing, networking and storage resource types) is necessary. By the application of the coordination of utilization, control and management of computing, storage, and networking resources for the purpose of provisioning and optimization, satisfaction of requirements of resources' users and improvement of resource utilization may be achieved. This Recommendation specifies the requirements for coordination of networking and computing in IMT-2020 networks and beyond (CNC).
- **ITU-T Y.3401 “Coordination of networking and computing in IMT-2020 networks and beyond - Capability framework” (under approval)**: The emergence of new services puts forward the need for the support of critical service requirements on computing, networking and storage resources at the same time. The coordination among resources of the same or different types (computing, networking and storage resource types) enabled by new capabilities is necessary. By the coordination of utilization, control and management of computing, storage, and networking resources for the purpose of provisioning and optimization, satisfaction of requirements of resources' users and improvement of resource utilization may be achieved. This Recommendation provides a capability framework for the coordination of utilization, control and management of computing, storage, and networking resources in IMT-2020 networks and beyond, including the interactions among the capabilities of the CNC (Coordination of Networking and Computing in IMT-2020 networks and beyond) capability framework.
- [ITU-T Y.Suppl.40 to Y.3600 series “IMT-2020 standardization roadmap”](#) provides the standardization roadmap for IMT-2020 and beyond in the information and communication technologies area. This revised Supplement 59 to ITU-T Y.3100-series Recommendations IMT-2020 and beyond standardization roadmap has been developed to assist in the development of IMT-2020 and beyond related standards in the ICT fields by providing information about existing and under developing standards in key standards development organizations (SDOs).
- [ITU-T Y.Suppl.81 to Y.3200 series “Use cases of satellite communications in Developing Countries”](#): Satellite communications is the type of communications using satellite-borne equipment(s) as part of or all of the communications network. In Developing Countries, considering the limitation on capabilities and capacity of land-based networks, use of satellite communications is important. This Supplement specifies some use cases and the corresponding requirements of satellite communications networks in Developing Countries, in the context of non-radio aspects of IMT-2020 networks and beyond.

- o [ITU-T Technical Report TR.Reqts-SAN “Requirements of semantic-aware networking for future networks”](#): Semantic-aware network (SAN) adopts machine and human-shared semantic terms and syntax to represent, annotate, analyse, and interpret network and user generated data, and is a promising candidate to support automatic data analysing, processing, and learning for future networks including IMT-2020. This Technical Report identifies potential requirements of SAN for future networks.

174. ITU-T study groups developed Recommendations and other texts in the context of Action Line C6:

- **ITU-T F.748.39 “Functional requirements and reference architecture of artificial intelligence cloud platform for smart grid operation and maintenance” (under approval)** describes functional requirements and reference architecture of artificial intelligence cloud platform for smart grid operation and maintenance.
- o [ITU-T H.626.7 “Functional architecture for machine vision systems in smart manufacturing”](#) specifies the architecture of machine vision systems for supporting the communication between endpoint, application and machine vision systems in smart manufacturing, so as to help ender users and providers to specify the machine vision tasks and the solutions, enhance confidence in machine vision ecosystem and open new applications for machine vision systems.
- o [ITU-T H.715.12 “Formal verification framework for smart contract on distributed ledger technology”](#): Smart contracts can be used to reduce complex business contracts by directly enforcing the contract's payment methods and paybacks, and by automating the process of contract execution and verification into the network, without the intervention and cost of the person checking the contract's performance. However, smart contracts are a series of program codes generated on distributed ledger technology (DLT) and problems may occur in the process of executing the smart contract. As a method to solve problems that occur in the program execution environment, there is a formal verification. This Recommendation specifies formal verification framework for smart contract on distributed ledger technology (DLT), its overview, requirement and architecture in its framework, as well as the main technical direction of its formal method component. This Recommendation can be used as a guideline for smart contract developer to build systems.
- o [ITU-T H.751.17 “Smart contract lifecycle management requirements for distributed ledger technology systems”](#) specifies the requirements for the smart contract lifecycle, including design, development, compliance, deployment, triggering, execution, maintenance and management. By addressing these areas, distributed ledger technology (DLT) systems can efficiently realize and support programmable and intelligent functions.

- o [ITU-T H.862.7 “Interoperability framework for sleep management services”](#): Sleep occupies a third of our lives and helps to relieve the physical and mental fatigue of daily life and lead a smooth daily life. Therefore, it is possible to obtain an improvement effect that can enhance the quality of life based on the understanding of sleep time and quality through sleep monitoring. With the growth of the sleep market, various sleep monitoring products combined with ICT technology are being launched, and these products are mainly composed of dedicated apps and sensors. The use of products composed of such dedicated software for each sensor is a major limitation in service operation because it is difficult to integrate with existing service data and difficult to share data with other services when changing the product or using it with other services. This Recommendation introduces a way to provide an open, interoperable API for smart sleep management devices and sleep services. In order to provide an individual with optimal sleep, data collection, analysis, and customized services on individual sleep are required. For this, interoperability between IoT-based sleep management devices and services must be secured. Interoperability of services covered by this Recommendation includes interoperability of data and interoperability at the API level.
- [ITU-T J.1206 “The application programming interface of smart TV operating system”](#) specifies the application programming interface of a smart TV operating system over integrated broadcast and broadband cable networks. A smart TV operating system is intended to be installed in an integrated broadcast and broadband (IBB)-capable cable set-top box (STB) and TV and to enable broadcasting and IP-based interactive services provided by cable television operators and third-party providers.

175. Internet of Things (IoT), Digital Twins and Smart Sustainable Cities & Communities standardization progressed and numerous ITU-T Recommendations and other texts were developed.

- o [ITU-T Y.4222](#) “Framework of smart evacuation in a disaster or emergency in smart cities and communities” describes concepts and features of smart evacuation control in disaster and emergency situations.
- o [ITU-T Y.4229](#) “Requirements and reference functional model for an Internet of things-based smart forest firefighting system” introduces a smart forest firefighting system based on the Internet of things (IoT), for which it specifies a reference functional model and requirements.
- o [ITU-T Y.4230](#) “Requirements and capability framework for a public smart charging service for electric vehicles” specifies the requirements and capability framework for a public smart charging service for EVs, to optimize the EV charging service process and improve the EV charging service experience of EV users.

- o [ITU-T Y.4237](#) “Requirements and capability framework of digital twin for intelligent water conservancy system” specifies the requirements and capability framework of the digital twin for intelligent water conservancy system (DT-IWCS).
- o [ITU-T Y.4507](#) “A functional architecture of Internet of things-based warning system for power supply facilities” provides the functional architecture of a power supply facility warning system, use cases and data flows.
- o [ITU-T Y.4510](#) “Functional architecture of smart power bank rental service framework” introduces the SPBR service and specifies its functional requirements and functional architecture framework to provide guidance for device manufacturers and service providers when developing SPBR equipment and services.
- o [ITU-T Y.4708](#) “Management framework for IoT-based distributed power equipment” provides the management framework for IoT-based distributed power equipment, including the framework, functional systems and reference interfaces.
- o [ITU-T Y.4609](#) “Inventory metadata for IoT-based electric power infrastructure monitoring system” presents inventory metadata for the IoT-based electric power infrastructure monitoring system.
- o [ITU-T Y.4706](#) “Data exchange model for Internet of Things-based devices in power transmission and transformation equipment” provides the requirements and model of IoT data exchange in power transmission and transformation equipment.
- o [ITU-T Y.4911](#) “Key performance indicators of ICT-based data support capabilities for urban flood disaster prevention and mitigation” specifies a set of key performance indicators to assess ICT-based data support capabilities for urban flood disaster prevention and mitigation.
- o [ITU-T Y.Suppl.58](#) “Global Standards Landscape for Internet of things, digital twins and smart sustainable cities and communities” presents the global standards landscape of Joint Coordination Activity on Internet of Things, Digital Twins and Smart Sustainable Cities and Communities (JCA-IoT, DT and SSC&C), which contains a collection of standards and ITU-T Recommendations related to Internet of things (IoT), digital twins, smart sustainable cities and communities (SSC&C), network aspects of identification systems, including radiofrequency identifier (RFID) (network aspects of identification systems, including RFID (NID)) and ubiquitous sensor networks (USNs).
- o [ITU-T Y.Suppl.85](#) “ITU-T Y.4000-series - Use cases of IoT-based smart aquaculture” surveys use cases related to smart aquaculture in the perspective of, but not limited to: 1) IoT-based and AI-based monitoring and automation for

- fish farming, 2) IoT-based water quality management for fish farming, 3) IoT-based and AI-based water quality optimization for sustainable aquaculture, 4) IoT-based growth management of fish, 5) Autonomous feeding control based on IoT and AI technologies and 6) IoT-based and AI-based smart energy management for fish farming.
 - o [ITU-T YSTR.Ambient IoT](#) “Analysis on requirements and use cases of ambient power-enabled IoT” conducts an analysis on potential requirements and use cases of ambient power-enabled IoT.
176. The [Digital Transformation Resource Hub](#) provides a wide range of quality publications on digital transformation topics, including smart sustainable cities, digital public infrastructure, artificial intelligence, Internet of things, blockchain, digital twin, metaverse and virtual worlds and digital transformation trends.
177. An ITU-T Global Portal on Environment and Sustainable Digital Transformation highlights the latest external resources related to three distinct topics, including: energy efficient ICTs; e-waste management and circular economy; and climate change. This Global Portal also provides link to ITU's IoT and SC&C Standards Roadmap.
178. A [Toolkit on Digital Transformation for People-Oriented Cities and Communities](#) has been developed to support cities and communities. The resources contained in this Toolkit include international standards and guidance, the latest research and projections, and cutting-edge reports on a variety of timely topics relevant to the digital transformation of cities and communities.
179. ITU has been organizing the [Digital Transformation Dialogues \(DTD\)](#). DTD offers a dynamic platform to facilitate a deeper understanding of emerging technologies to reshape traditional processes, improve operational efficiency and unlock new possibilities for innovation and standardization. The Digital Transformation Dialogues seeks to address evolving themes associated with digital transformation, foster cooperation among city stakeholders, and examine the role of standardization within this domain. The Digital Transformation Dialogues serve as a unique platform for highlighting the latest work and outcomes of the ITU-T Focus Groups, Initiatives and ITU-T Study Groups. DTD covers webinars, fireside chats and ask the expert sessions.
180. ITU has consistently published the Digital Transformation and Cities Digest. Copies of the Digest are available for access on the [Digital Transformation and Cities Digest webpage](#).
181. An ITU-T Global Portal is maintained with special focus on activities in the Africa, Asia Pacific, Arab, and Americas regions.
- o ITU-T’s work on accessibility has started early 1990s with ITU-T V.18 text telephone. Since then, ITU-T SG16 and now ITU-T SG21 has developed a number of ITU-T standards on accessibility, within [Question 1/21](#) on accessibility and

Question 4/21 on human factors, **cooperating with advocacy organizations** (such as the G3ict, WFD) in addition to other technical groups, and **with participation of persons with disabilities**. [Accessibility and Standardization](#) shows examples of ITU-T work.

182. In addition, as accessibility is a cross-cutting subject through various ICT technologies, **multiple ITU-T Study Groups**, including, ITU-T [SG2](#) (Operational aspects), and [SG20](#) (IoT, digital twins and smart sustainable cities and communities) have Work Items related to accessibility.

183. In addition to Study Groups, the following groups also work on accessibility:

- ITU-T Joint Coordination Activity on Accessibility and Human Factors ([JCA-AHF](#)): **coordination** group on activities concerning accessibility;
- ITU Intersector Rapporteur Group Audiovisual Media Accessibility ([IRG-AVA](#)): **joint group** of ITU-R SG6 and ITU-T SG21 working on standardization on accessibility of audiovisual media considering a number of delivery systems.
- Joint technical specification development with ISO/IEC JTC1/SC35 "User interfaces" for accessibility of ICT systems and services.
- [ITU-T Technical Report FSTP-ACC-MV-SUST “Accessibility in a sustainable metaverse”](#) promotes and instructs on the adaptation of an integrated approach to accessibility and sustainability in the metaverse. It explores the integration of accessibility products and services in the metaverse and their associated social benefit and environmental impact. Emphasising the need for the early integration of accessibility and sustainability, this document presents information and guidance on how to incorporate sustainable accessibility products and services in the metaverse from the outset. Questions related to sustainability and accessibility in the metaverse need to consider the following:
 - Social benefit of sustainable accessibility products and services in the metaverse.
 - Challenges and opportunities of an accessible and sustainable metaverse.

184. Additional details about other activities implemented by BDT in all ITU regions can be found in BDT's quarterly and annual performance reports: [<https://www.itu.int/en/ITU-D/Pages/OperationalPlansPerformanceReports.aspx>](https://www.itu.int/en/ITU-D/Pages/OperationalPlansPerformanceReports.aspx).

185. The ITU-R Study Groups are the collaborative enabling environment for the development of global standards (Recommendations), Reports and Handbooks on radiocommunication matters. Specialists from administrations, the telecommunications industry, and academic organizations from around the world participate in the work of the Study Groups on topics such as efficient management and use of the spectrum/orbit resource, radio systems characteristics and performance, spectrum monitoring and emergency radiocommunications for public protection and disaster relief.

186. The following link contains a comprehensive list of ITU-R publications linked to the SDGs. These include ITU-R Recommendations, Reports, Handbooks and Questions relevant to the WSIS Action Lines: <https://www.itu.int/en/ITU-R/study-groups/Pages/Sustainable-dev-goals.aspx>.
187. Recommendations developed within the enabling environment of the ITU-R Study Groups include the development and implementation of globally accepted standards for International Mobile Telecommunications (IMT) systems. The current IMT 2020 (5G) and earlier generations of mobile telecommunication, analogue cellular (1G), digital cellular (2G), IMT 2000 (3G), IMT Advanced (4G) were standardized within ITU. Progress is now underway within ITU-R towards the next phase of IMT development, [IMT-2030](#).
188. Radiocommunication Assemblies (RAs) are responsible for the structure, program and approval of radiocommunication studies. They are normally convened every four years and may be associated in time and place with World Radiocommunication Conferences (WRCs). The Assemblies enable and provide the necessary technical basis for the work of WRCs, respond to other requests from ITU conferences, and suggest suitable topics for the agenda of future WRCs. They also approve and issue ITU-R Recommendations and Questions developed by the Study Groups, set the program for and disband or establish Study Groups as required.

c) Co-facilitator of Action Lines C1, C3, C7, C11 and Partners for C8 and C9.

Action Line C1: The Role of Public Governance Authorities and all Stakeholders in the Promotion of ICTs for Development



[Related to SDGs:](#) SDG 1, SDG 3 (3.8, 3.d), SDG 5, SDG 10 (10.c), SDG 16 (16.5, 16.6, 16.10), SDG 17 (17.18)



189. In accordance with its mandate, the ITU continues to foster international and regional cooperation on a broad range of activities. ITU conducted several meetings, conferences and symposiums to provide a platform to broaden international dialogue on innovative means in harnessing ICTs for advancing development. In 2025, ITU organized a number of events. Series of regional meetings on private-public partnerships as a solution to address the needs of regions for digital technology deployment were organized.
190. In accordance with [Resolution ITU-R 72](#), the ITU Radiocommunication Sector (ITU-R) promotes gender equality and equity. It also promotes bridging the contribution and participation gap between women and men in ITU-R activities.
191. The 20th Action Line Facilitation Meeting of C1 and C11 was held on Thursday, 10 July 2025 on the topic of “Enhanced Cooperation in the Digital Age: From Concept to

Commitment at WSIS+20”. The session reaffirmed the relevance of enhanced cooperation as defined in the Tunis Agenda and highlighted broad agreement on the need for a structured and inclusive mechanism to operationalize it beyond 2025. Details of the session are available [here](#).

192. The WSIS Prizes 2025 Winner for the Action Line C1 is: Situational-Analytical Complex, Kazakhstan. Details of the project are available [here](#).

193. Advisory **Groups for each Sector: Advisory Groups for each Sector meet every year** and review priorities, strategies, operations and financial matters of the Sector. Please see the Advisory Groups for the sectors below:

- The Telecommunication Development Advisory Group (TDAG) for the ITU-D. In 2023, TDAG was held from 19 to 23 June. Please see <https://www.itu.int/en/ITU-D/Conferences/TDAG/Pages/default.aspx>.
- Telecommunication Standardization Advisory Group (TSAG) for the ITU-T. The second meeting of the TSAG was held from 30 May to 2 June 2023 at the ITU headquarters, Geneva. TSAG entered the 2022-2024 study period with a strong mandate to prepare restructuring of ITU-T study groups. The leaders of ITU’s standardization expert groups (ITU T study groups) are invited to play a central role in this work, highlighting the basis of the future ITU-T study group strategy.
- [The Radiocommunication Advisory Group \(RAG\)](#) is tasked in accordance with the ITU Constitution (CS 84A) and Convention (CV 160A-160H) to review the priorities and strategies adopted in the Radiocommunication Sector; provide guidance for the work of the Study Groups; recommend measures to foster cooperation and coordination with other organizations and with the other ITU Sectors.

194. Study Groups for each sector:

- Standardization work is carried out by the technical Study Groups (SGs) in which representatives of the ITU-T and ITU-R membership respectively develop Recommendations (standards) for the various fields of international telecommunications and radiocommunications.
- ITU-D Study Groups provide an opportunity for all Member States and Sector Members (including Associates and Academia) to share experiences, present ideas, exchange views, and achieve consensus on strategies to address ICT priorities. ITU-D Study Groups are responsible for developing **Reports, Guidelines, Best Practices and Recommendations** based on input received from the membership. Information is gathered through contributions, case studies and surveys and is made available for easy access by the membership using content management and web publication tools. The Study Groups examine specific task-oriented telecommunication/ICT questions of priority to countries, especially developing countries, to support them in achieving their development goals and SDG targets.

- Outputs agreed on in the ITU-D Study Groups, and related reference material, are used as guidance for the implementation of policies, strategies, projects, and specific telecommunication/ICT initiatives in membership. These activities also serve to strengthen the **shared knowledge base** of the membership. Sharing of topics of common interest is carried out through face-to-face meetings, multilingual remote participation and online collaborative sites, in an atmosphere that encourages **open debate** and **exchange of information** and for receiving input from experts on the topics under study.
- ITU-D Study Group 1 scope focuses on "Enabling environment for the development of telecommunications/ICTs" while the work of ITU-D Study Group 2 relates to "ICT services and applications for the promotion of sustainable development".
- 9 webinars were also organized by the ITU-D Study Groups from 27 May to 29 July 2020, which shared analyses of the response to the global COVID-19 pandemic from the perspective of specific ITU-D Study Group Questions. The areas covered by the webinars were related to several WSIS Action Lines. The detailed programmes can be found in the following link: www.itu.int/go/COVID19-dialogues. A full list of workshops and events held by ITU-D Study Groups during the 2018-2021 study period can be found in the following [link](#).
- The [ITU-R Study Groups](#) develop the technical bases for decisions taken at World Radiocommunication Conferences and develop global standards (Recommendations), Reports and Handbooks on radiocommunication matters. More than 5000 specialists, from administrations, the telecommunications industry as a whole, and academic organizations from around the world, participate in the work of the ITU-R Study Groups on topics such as efficient management and use of the spectrum/orbit resource, radio systems characteristics and performance, spectrum monitoring and emergency radiocommunications for public protection and disaster relief. The following link contains a comprehensive list of ITU-R publications linked to the SDGs. These include ITU-R Recommendations, Reports, Handbooks and Questions relevant to the WSIS Action Lines: <https://www.itu.int/en/ITU-R/study-groups/Pages/Sustainable-dev-goals.aspx>.

195. World Telecommunication Development Conferences

The World Telecommunication Development Conference (WTDC) is an international event organized every 4 years by the ITU. WTDC sets the agenda and guidelines for the ITU-D Sector for the following four-year cycle, while Regional Conferences review "work-in-progress" towards the overall objectives and ensure that goals are met. The Telecommunication Development Conferences serve as forums for the discussion of the digital divide, telecommunications and development by all stakeholders involved in and concerned with ITU-D's work. In addition, they review the numerous programmes and

projects of the Sector and Telecommunication Development Bureau. Results are reported and new projects are launched. Each Regional Preparatory Meeting brings together the countries in its region to explore and discuss their needs and the present and future projects of the Sector.

196. ITU-D Study Groups provide an opportunity for the membership to share experiences, present ideas, exchange views, and achieve consensus on appropriate strategies to address telecommunication/ICT priorities. The Study Groups examine specific topics of importance to developing countries to support them achieving the SDG targets and their specific development priorities. [ITU-D Study Groups 1 and 2: Questions Under Study](#) and their linkages with SDGs and WSIS Action Lines.
197. The [World Radiocommunication Conferences \(WRC\)](#) are held every three to four years to review, and, if necessary, revise the Radio Regulations. This is the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Revisions to the Radio Regulations are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world Radiocommunication Conferences. The Final Acts of WRC-23 entered into force on 1 January 2025. Contributing studies are underway for next WRC which will be held in 2027.

Action Line C3: Access to Information and Knowledge



[Related to SDGs:](#) SDG 1, SDG 2, SDG 3, SDG 4, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 10, SDG 11, SDG 12, SDG 13, SDG 14, SDG 15, SDG 16, SDG 17



198. In 2024, ITU held numerous webinars, conferences, events, to promote digital inclusion. See details here: <https://www.itu.int/en/ITU-D/Digital-Inclusion/Pages/Digital-Inclusion-Events.aspx>.
199. UNESCO organised the WSIS Action Line Facilitation Meeting C3, which took place on 10 July 2025, during the WSIS+20 High-Level Event 2025. The meeting focused on the topic of “Investing in Equitable Knowledge Access: Diamond Open Access”. For more details on the sessions and the outcomes, please see [here](#).
200. The WSIS Prizes 2025 Winner for the Action Line C3 is Digital Awareness Programme, Nigeria. Details of the project are available [here](#).
201. ITU continues to ensuring inclusive, equal access and use of ICTs for all by supporting:
- (i) Member States, sector members and academia in the formulation and implementation of policies and strategies on digital inclusion, as well as awareness raising and advocacy, sharing good practices and knowledge, building capacity and the development products/services; and
 - (ii) specific local communities (children,

youth, older persons, women, persons with disabilities and indigenous people) through multi-stakeholder partnerships, collaborations and initiatives, to implement scalable roadmaps, actions, activities, and projects, to reduce the digital divide and towards more inclusive, equal access and use of ICTs for all.

202. ITU activities and resources on ICT Accessibility aim to contribute to ITU members' efforts to accelerate the implementation of digital accessibility as a means to enable digital inclusion and ensures inclusive communication for all people – regardless of their gender, age, ability or location.
203. These resources and tools include policy guidelines, toolkits, trainings (on-line/ face to face) ICT accessibility (in country) educational programmes, video tutorials; and in-country and regional assessments. Specific resources on COVID19 response and recovery were also developed. These resources were designed, developed, and made available in several UN languages to support ITU members in the regional and global implementation of ICT accessibility. Online trainings are delivered through the ITU Academy free of charge and self-paced, with localized content and the possibility of certification.
204. All ITU-D resources on ICT accessibility are delivered in accessible formats to ensure that persons with disabilities can also benefit. Examples of these resources are:
- The ITU toolkit “[Towards building inclusive digital communities](#),” and interactive self-assessment for ICT accessibility implementation (2021);
 - Self-Paced online training courses such as: ICT Accessibility: the key to inclusive communication (currently available in: Arabic, English, French, Russian and Spanish), and Web Accessibility - the Cornerstone of an Inclusive Digital Society (currently available in: Arabic, English, French, Russian and Spanish). These training courses are available through ITU Academy, free of charge and provided in digitally accessible format (they can also be followed by persons with disabilities). If the knowledge acquired is successfully validated, the training courses offer ITU certification;
 - ITU video-tutorial on the development of an in-country self-assessment (ITU toolkit, 2021);
 - Video-tutorial on: ICT Accessibility: the key to achieving a digitally inclusive world (2021);
 - ITU Report on the Information and Communication Technology (ICT) Accessibility Policy Review of the Republic of Serbia (2021);
 - ITU regional assessment on ICT accessibility for the Africa Region (2021);
 - ICT accessibility assessment report for the Europe region (2021);
 - ITU guidelines on how to ensure that digital information, services and products are accessible by all people, including persons with disabilities during COVID-19 (2020,

in Arabic, Chinese, English, French, Spanish, Russian). These guidelines were selected and translated by the UN COVID-19 emergency group into the 22 most spoken languages in the world;

- ITU regional assessment on ICT Accessibility for the Asia-Pacific region (2020);
- On-line self-paced training on: How to ensure inclusive digital communication during crises and emergency situations (2020, in English, French, Spanish);
- Video- tutorial on: How to ensure inclusive digital communication during crisis and emergency situation (2020, in English, French, Spanish);
- Updated and localized On-line self-paced training on ICT Accessibility: The key to inclusive communication (2020, in Arabic, English, French, Russian and Spanish);

205. For more information on the work and resources on ICT Accessibility see here: <https://www.itu.int/en/ITU-D/Digital-Inclusion/Pages/ICT-digital-accessibility/default.aspx>.

206. ITU Europe is hosting a Regional Forum for Europe on “: [Accessible Europe: ICT 4 All Forum \(itu.int\)](#)” on the 13-14 December 2023. Accessible Europe is held within the framework of the Regional Initiative for Europe 3 on “*Digital inclusion and skills development*” adopted by the World Telecommunication Development Conference 2021. The Forum mark the International Day of Persons with Disabilities, celebrated annually on the 3rd of December. The Forum is organized by the International Telecommunication Union (ITU) and the European Commission (EC), and co-organized by the AccessibleEU Resource Centre. It is hosted by Fundación ONCE, supported by the Government of Spain. This year edition will have a special focus on universal design, AI, emerging technologies, and Metaverse. It will also include a pitching session where stakeholders across the region will be invited to present their innovative solutions submitted to the call for good practices preceding Accessible Europe Forum. Attendees will have the opportunity to participate in a public vote to recognize the most impactful solutions presented.

207. ITU developed and is maintaining a database for following the transition from analogue to digital terrestrial television broadcasting: <http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx>.

208. The [World Radiocommunication Conferences \(WRC\)](#) are held every three to four years to review, and, if necessary, revise the Radio Regulations. This is the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Revisions to the Radio Regulations are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world Radiocommunication Conferences. The Final Acts of WRC-23 entered into force on 1 January 2025. Contributing studies are underway for next WRC which will be held in 2027. Access to information on the Radio Regulations and related provisions is maintained and available on the [ITU-R Regulatory Publications](#) webpage. The ITU-R

Study Groups develop the technical bases for decisions taken at World Radiocommunication Conferences. Details of ongoing studies, including those related to the current WRC study cycle are provided on the [Radiocommunication Study Groups](#) webpage. A list of the [recently approved outputs from the ITU-R Study Groups](#) is also available.

209. The Radiocommunication Bureau (BR) organizes the [World Radiocommunication Seminars \(WRS\)](#) on spectrum management every two years, providing Member States with direct access to essential information, training, and tools. These seminars, along with their associated workshops, serve as a vital platform for capacity-building, offering practical guidance and technical expertise on spectrum management. The WRS strengthens national capabilities and promotes efficient, effective, harmonized spectrum use across regions through tailored training sessions, comprehensive information briefings, and the development of handbooks and digital tools. This capacity-building initiative supports Member States and fosters global cooperation in radiocommunications by providing access to key technical information and relevant knowledge resources.
210. In addition to the World Radiocommunication Seminars, the Radiocommunication Bureau (BR) organizes [Regional Seminars](#) to address the particular needs of developing countries. The Regional Seminars provide access to information and knowledge which directly supports Member States and promotes capacity-building. The Seminars are arranged to equitably cover all ITU Regions. To further support capacity-building, the BR also provides individual training upon request.
211. The [Global Initiative on Virtual Worlds and AI – Discovering the Citiverse](#) works on digital inclusion and accessibility in the citiverse and virtual worlds.

Action Line C7: ICT Applications

Action Line C7: E-Government



[Related to the SDGs:](#) SGD 9 (9.c), SDG 16 (16.6, 16.7, 16.10), SDG 17 (17.8)



212. The WSIS Prizes 2025 Winner for the Action Line C7 on e-Government is: TAMM AI Assistant: The AI-Powered Government Agent Redefining Public Services, United Arab Emirates. Details of the project are available [here](#).
213. ITU-Estonia-GIZ-DIAL Digital Government project: the GovStack initiative

ITU in collaboration with Estonia, GIZ/Germany and the Digital Impact Alliance have jointly launched the GovStack initiative⁴, which is an effort to accelerate governments digitalization and Transformation towards the attainment of SDG.

The initiative is an expert community-driven multistakeholder effort aimed at assisting countries to build a shared “Digital Government Services Infrastructure” or a “Government Technology Stack” that is constituted of a set of reusable common foundational digital capabilities and services – called also Building Blocks – such as Digital ID, Information Exchange, Payments Gateway, Registrations, Security, etc. that can be used by the whole-of-government through any government agency or department to build new government digital services without having to design, test and operate the underlying systems and infrastructure themselves. This “digital public services infrastructure” effectively sits ‘on top’ of the internet, is ubiquitous, available for all (i.e., as a utility) and provides the basic requirements to accelerate a sustainable digital economy. It is therefore the engine or the heart of green digital transformation. It will reduce the time and effort needed to introduce new truly green and sustainable digital services that could be scaled up and upgraded in a more agile, accelerated, and cost-effective manner.

214. The WSIS Digital Service Design Prize 2023 was initially announced at the 2022 WSIS Forum by Ambassador-at-large for Digital Affairs Nele Leosk of Estonia and the Head of the Digital Development Programme and GIZ Björn Richter. The Prize specifically spotlights innovative and impactful government service designs that are based on a [building block](#) approach. The Prize will highlight digital service designs that address citizen/resident need(s) through improving, innovating, or developing government processes, and are designed for scalability, extensibility, and adaptability to a variety of generic workflows. The Prize supported by GovStack founding partners: ITU, the Digital Impact Alliance, GIZ, and **Republic of Estonia**. **WSIS Digital Service Design Prize 2024** winner is [National Information Technology Authority \(NITA\), Uganda](#) and their project to UGPass,

215. In October 2023, ITU launched a [“Spotlight Series on Human-Centric Digital Transformation”](#) which buildt upon the ITU Regional Development Forum for Europe (RDF-EUR) submission from the Republic of Poland and the Czech Republic on such a topic. This initiative was therefore rolled out in collaboration with both countries and in cooperation with all Countries of the Europe Region. This initiative was held in line with ITU Regional Initiatives for Europe 2 on "Digital Transformation for Resilience," as well as 3 on "Digital Skills and Inclusion" and 4 on "Trust and Security in the use of ICTs". It consisted of a series of workshops that aimed to deepen the understanding of 'human-by-design' digital features, by showcasing concrete examples of human-centric digital transformation projects in Europe within government services, education, and health, pinpointing challenges, opportunities, and emerging trends in the field. Case studies as well as insights and policy recommendations on good practices were collated in a [Compendium](#), aimed to

⁴ www.govstack.global

inform future human-centered digital (services) development strategies both within Europe and globally.

216. The Human Centric Approach to Digital Transformation⁵, organised as a side event to the Regional Forum on Sustainable Development for the UNECE region, was held online, on 11 March 2024. The event was organised by the UN Digital Transformation Group for Europe and Central Asia, in coordination with Republic of Poland, the Czech Republic, UNECE and ITU. This session provided an opportunity for presenting the outcomes of several initiatives in this field carried out by diverse UN agencies and stakeholders. This included the outcomes of the ITU initiative implemented in 2023, in cooperation with Poland and Czech Republic, i.e. Human-Centric Digital Transformation Compendium. A series of concrete examples of human-centric digital transformation projects in Europe within government services, education and health, pinpointing challenges, opportunities, and emerging trends in the field were presented and discussed, facilitating engagement with the audience to explore the topics further.
217. Insights and recommendations on good practices, will aim to inform future digital development strategies both within the UNECE region and globally, and help advance the various SDGs, particularly related to SDGs 1 (No Poverty), 2 (Zero Hunger), 13 (Climate Action), 16 (Peace, Justice and Strong Institutions) & 17 (Partnerships for the Goals).
218. The Smart Villages project in Niger aims to transform 20 rural villages into smart villages during its first phase. It will deploy a range of ICT-enabled solutions to the villages selected by the Government of Niger based on the successful proof of concept that has been conducted earlier in two villages in Niger. It will bring about a positive change in the quality of life by providing connectivity and new ICT-enabled services to the local communities while also promoting interoperability, cooperation, and holistic demand-driven response to the SDG-related needs.
219. Smart Islands⁵. A Joint Programme (JP) was developed related to “Accelerating SDG achievement through digital transformation to strengthen community resilience in Micronesia” to be funded by the Joint SDG Fund. The programme adopts an SDG-based approach to digital transformation across Micronesian countries. Digital technologies, as experienced worldwide during the pandemic, serve as a powerful tool to facilitate the much needed social and economic transformation towards the achievement of the SDGs as Pacific Islands Countries continue to embark on the digital transformation journey. The traditional supply-side, siloed approaches to providing public goods and services do not address the problem in a holistic and sustainable manner. An SDG based integrated planning approach (policy, legislation, strategy and delivery of digital services) customized to local needs and priorities can address multiple high priority challenges experienced by the citizens through digital devices and service.

⁵ [Smart Islands \(itu.int\)](https://itu.int)

220. Fundamentally, two outcomes are targeted: Outcome 1: Promoting enabling policy and legislative framework that benefit communities and vulnerable groups that accelerate achieving SDGs and digital transformation (including internet development). Outcome 2: Access to resilient broadband connectivity facilitated through pilots in at least 5 remote islands and villages, one each in the 5 countries, to accelerate their digital transformation to smart islands / digital villages with access to a range of digitally enabled services that meaningfully improve: livelihoods; healthcare; the enjoyment of human rights; skills in harnessing the digitally enabled services; education and job opportunities, food availability and nutrition; digital finance and information; response to natural disasters; maritime security.
221. The project addresses the need of interventions that would help African countries to transform into digital economies and to adopt e-applications geared to sustainable development in various aspects of African economies. The project provides a model for assistance in the development of digital inclusive services and interventions specifically targeted at achieving social and economic development and inclusion through improving digital literacy and access. The project seeks to establish a model in Niger that could be replicated in other countries in the region by learning from experiences and lessons.

Action Line C7: E-Health



Related to the SDGs: e-health: SDG 1 (1.3, 1.4, 1.5), SDG 2 (2.1, 2.2), SDG 3 (3.3, 3.8), SDG 5 (5.6, 5.b), SDG 17 (17.8, 17.10)



222. ITU/WHO organised WSIS Action Line Facilitation Meeting C7: E-Health on 7 July 2025. The theme of the meeting was “Fostering foundations for digital health transformation in the age of AI”. For more details on the sessions and the outcomes, please see [here](#).
223. The WSIS Prizes 2025 Winner for Action Line C7 on E-Health is: A New Era in Zanzibar’s Healthcare: The Game-Changing Role of Digital Unique IDs, Tanzania. Details of the project are available [here](#).
224. The WHO-ITU have initiated a project (2017-2021) to establish an mHealth Knowledge and Innovation Hub through financial support the European Commission (EC) Horizon2020 Programme. This will enable both the development of national mHealth interventions in selected EU member states to champion the uptake of mHealth and the foundation and maintenance of a centralised ‘Knowledge and Innovations Hub for mHealth’ to monitor and enable mHealth adoption and innovation.
225. ITU developed content for the specialized multimedia courses focusing on the use of ICTs in healthcare, including telemedicine and courses for IT specialists on the maintenance of medical information systems (jointly with Odessa National Academy of Telecommunications, Ukraine).

226. In the 2017-2021 study period this topic is addressed by ITU-D Study Group 2 [*Question 2/2: Telecommunications/ICTs for e-health*](#). The final report from the 2014-2017 study period on “Information and telecommunications/ICTs for e-health” is available at the following [link](#).

227. The Global Initiative on AI for Health (GI-AI4H) is a joint effort by ITU, the World Health Organization (WHO) and the World Intellectual Property Organization (WIPO) that builds on the foundational work of the ITU-WHO Focus Group on AI for Health ([FG-AI4H](#)) and serves as a long-term institutional platform to enable, facilitate, and implement trustworthy and evidence-based AI solutions in healthcare systems worldwide. Aligned with WSIS+20’s emphasis on digital transformation and universal health coverage, GI-AI4H contributes to Action Line C7 by:

- **Enabling** standards, governance, and policy frameworks for ethical AI deployment.
- **Facilitating** global knowledge exchange and pooled investments to foster inclusive innovation.
- **Implementing** sustainable AI models tailored to national health strategies, especially in low-resource settings.

GI-AI4H’s integration into WSIS Action Line C7 was highlighted during the WSIS+20 High-Level Event, where sessions focused on digital public infrastructure, financing, and regional collaboration for digital health transformation. The initiative exemplifies how AI can be harnessed to advance the WSIS goals of equitable access, interoperability, and people-centred health systems.

228. ITU-T study groups developed the following Recommendations and other texts:

- o [ITU-T F.748.28 “Requirements and functional architecture of digital twin platform for supporting multimedia services”](#): Multimedia services are becoming increasingly useful for education, video-based marketing, digital museum, E-health, etc., providing an enriched user experience in e-meetings, distance training and product demonstrations. Digital twin realizes the interconnection, intercommunication and interoperability between the physical world and the digital world, constructs the description, diagnosis, prediction and decision-making of the physical world in the virtual world. At present, the digital twin system in different multimedia services has common requirements and functions, and it is necessary to develop a digital twin platform to realize the services for upper multimedia applications. The digital twin platform provides general services, twin services, interactive services for multimedia applications such as the fields of education, video-based marketing, digital museum, E-health, etc. This Recommendation specifies the requirements and functional architecture of digital twin platform for supporting multimedia services.
- o [ITU-T F.780.4 “Reference framework, requirements and scenarios for telemedicine systems”](#) describes the reference framework, requirements and scenarios of telemedicine system. Telemedicine system is an important application

of ICT in medical field, under the background of unbalanced medical resources, which can realize the optimal allocation of medical resources and benefit people in areas with less developed medical resources. It recommends the framework, functional requirements, and scenarios of telemedicine system which are the necessary hardware and software foundations for telemedicine. The Recommendation is suitable for the development, construction and evaluation of telemedicine system in different countries and regions.

- o [ITU-T F.780.5 “Requirements, reference framework and use cases for telemonitoring systems in rapid deployment hospitals”](#) describes the application scenarios, functional requirements, and reference architecture of telemonitoring systems in RDHs and applies them into their planning and designing in RDHs. The appendix to this Recommendation includes some use cases of the proposed reference system.
- o [ITU-T F.781.1 “General framework of quality control of medical images for machine learning applications”](#): The object of the Recommendation is to set up the initial framework for quality control on medical imaging for machine learning applications, including specifying the workflow of data quality control for machine learning application, the requirements of medical input image, medical image integration, medical image annotation and criteria on data quality for machine learning application.
- o [ITU-T F.781.2 “Quality assessment requirements for artificial intelligence/machine learning-based software as a medical device”](#): With the advent of artificial intelligence/machine learning (AI/ML) and its strength in faster and more accurate disease detection and diagnosis, it is inspiring that more timely and widespread adoption of decision-making assistant (DMA) software as a medical device (DMA-SaMD) would benefit improving health for human beings. However, that does not mean the AI/ML-based DMA-SaMD for decision making is ready for the clinic, AI/ML technology can only be used with complete confidence if it has been quality controlled through a rigorous evaluation in a standardized way. The performance and usability shall be assessed under a reliable and rigorous evaluation with a robust method to substantiate AI/ML-based DMA-SaMD quality. This Recommendation provides a requirement framework for the quality assessment with a perspective of lifecycle management for AI/ML-based DMA-SaMD. It describes the quality assessment principles and process in the life cycle of AI/ML-based DMA-SaMD, including requirement analysis, data collection, algorithm design, verification and validation, change control and other stages when using AI/ML technology to assist medical staff in making clinical decisions by providing suggestions on diagnostic and treatment activities.
- o [ITU-T H.861.0 \(V2\) \(revised\) “Requirements on communication platform for multimedia brain information”](#) describes a conceptual ecosystem intended to exchange brain data based on communication platform requirements and definitions. Starting from a background of brain data exchange in the context of e-health, a functional framework model for a multimedia brain information platform (MBI-PF) is outlined. This model is then developed into a set of communication

platforms which enable not only experts but also non-experts to utilize brain data for monitoring and maintaining health status of the brain.

- o [ITU-T Technical Report on “Guideline on safe listening at venues and events”](#) is aimed at reducing the risk hearing loss among audience members at venues and events that play amplified music/sounds. It forms part of ITU-T recommendations on safe listening for hearing protection. The World Health Organization (WHO) estimates that over one billion young people globally are at risk of hearing loss due to sound exposure in recreational settings. The risk of permanent hearing injury due to unsafe listening is both avoidable, and costly. "Unsafe listening" refers to the common practices of listening to music or other audio content at high levels or for prolonged time periods. In the face of this growing threat, governments, public-health agencies, those involved in the creation, distribution and amplification of music, the private sector, civil society, and other stakeholders, all have a duty of care in understanding the sound levels to which audiences and consumers are being exposed, and creating environments that facilitate safe listening behaviours.
- o [ITU-T Technical Report on “Conformance testing specification for ITU-T F.780.2”](#) describes the testing of the compliance of accessible telehealth platforms to the mandatory and recommended features of [ITU-T F.780.2].
- o [ITU-T Technical Report on “Outline and elements of basic telehealth services”](#) describes basic elements of telehealth/telemedicine, and outlines the fundamental services telehealth/telemedicine should provide. This Technical Paper gives a general outline of the roles involved in telehealth/telemedicine service, service classification, and function of the telehealth/telemedicine platform.
- o [ITU-T Y.4233](#) “ICT implementation framework for smart public health emergency management in smart and sustainable cities” specifies the ICT implementation framework of smart public health management in smart and sustainable cities (SSCs). SSCs are capable of fostering data-driven smart applications to manage limited resources and implement them to thwart the advent of future pandemics of a similar magnitude to the COVID-19 pandemic.
- o [ITU-T Y.4496](#) “Requirements and reference architecture of smart public health emergency information system” provides the requirements and reference architecture for a smart public health emergency information system that can be implemented to address current and future potential public health risks.

229. Jointly with WHO, experts started work on a new ITU-T H.SL-ES addressing safe listening in video gaming and esports and work progressed the WHO-ITU Technical Paper HSTP-SLD-Venue "Guideline on safe listening at venues and events". One new Recommendation was completed for ITU-T F.780.4 "Reference framework, requirements and scenarios for telemedicine systems" that describes the reference framework, requirements and scenarios of telemedicine system. Telemedicine system is an important application of ICT in medical field, under the background of unbalanced medical resources, which can realize the optimal allocation of medical resources and benefit people in areas with less developed medical resources. It

recommends the framework, functional requirements, and scenarios of telemedicine system which are the necessary hardware and software foundations for telemedicine. The Recommendation is suitable for the development, construction and evaluation of telemedicine system in different countries and regions.

230. Frequencies for the use of industrial, scientific and medical (ISM) applications which are designated in the Radio Regulations, have been identified from studies within ITU-R for health applications, such as solutions for impaired hearing. The development of [IMT 2030](#) is expected to further contribute to the delivery of improved digital-health and well-being services.
231. The engagement in the GovStack activities of the Government of Ukraine advanced significantly and were focused on the Ukrainian Platform of Registries, covering the Fit-Gap analysis as well as exploring the possible future steps in relation to the platform prototype development and its integration into the GovStack Sandbox. These efforts informed the development of the GovStack compliance methodology, paving the way for other countries to join and confirm compliance with GovStack specifications. Also, the Regional Office is continuously supporting the country in positioning itself as a frontrunner in eGovernment. In addition, the knowledge and best practice exchange in the field of digital services were facilitated between the Governments of Ukraine and North Macedonia.
232. To advance digital transformation in the European region and ensure the rollout of GovStack in the Western Balkans, three projects were co-developed with various UN agencies. Work has commenced on two projects financed by the Digital Window of the Joint SDG Fund in Albania and Serbia, and one project to be financed by the Joint Acceleration Fund in Montenegro. The project in Albania focuses on Digital Agriculture and Rural Transformation, the project in Serbia is titled "Digital Service Design Hub - Clicking Together with Citizens," and the project in Montenegro aims at the Digital Transformation of Local Self-Governments early.

Action Line C7: E-Agriculture



[Related to the SDGs:](#) e-agriculture: SDG 1 (1.5) , SDG 2 (2.3,2.4,2.a) , SDG 3(3.d), SDG 4, SDG 5 (5.5), SDG 8 (8.2) , SDG 9 (9.1 , 9.a) , SDG 12 (12.8) , SDG 13 (13.1)



233. The Action Line C7 E-Agriculture Facilitation meeting entitled “Advancing Human-Centered, Inclusive, Development-Oriented, and Sustainable Digital Solutions for Transforming Agrifood Systems” was organised by Food and Agriculture Organization (FAO) on 8 July 2025. For more details on the sessions and the outcomes, please see [here](#).
234. The WSIS Prizes 2025 Winner in category C7: e-Agriculture is: Vegetable Market Information System, Bhutan. Details of the project are available [here](#).

235. The series of most recent publications documenting success stories and promising practices in e-Agriculture are available here: <https://www.itu.int/en/ITU-D/ICT-Applications/Pages/e-agriculture-in-action.aspx>.
236. In the 2017-2021 study period this topic is addressed by ITU-D Study Group 2 Question 1/2: Creating smart cities and society: Employing information and communication technologies for sustainable social and economic development. The final report from the 2014-2017 study period on “Creating the smart society: Social and economic development through ICT applications” available at the following [link](#).
237. ITU-T Study Group 20 established the [Focus Group on Artificial Intelligence \(AI\) and Internet of Things \(IoT\) for Digital Agriculture \(FG-AI4A\)](#) in 2021. The Focus Group explored the potential of AI and IoT in supporting the adoption of innovative practices for agricultural production, while examining the barriers related to their use, and best practices for their optimal deployment. In this context, FG-AI4A focused on three key aspects including how to leverage AI and IoT and other emerging technologies for (i) data acquisition and management, (ii) conducting modelling, and (iii) facilitating effective communication for timely interventions, based on data derived related to agricultural production processes. The activities of FG-AI4A were being carried out in close collaboration with FAO. The Focus Group concluded its work in June 2024 and approved 5 deliverables, as follows:
- FG-AI4A Deliverable: Glossary – Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture
 - FG-AI4A Deliverable: Technical Report on “Ethical Legal, and regulatory Considerations relating to the use of AI for agriculture”: A European Perspective
 - FG-AI4A Deliverable: Technical Report on “Data Modelling for digital agriculture
 - FG-AI4A Deliverable: Technical Report - Use Cases for AI and IoT for Digital Agriculture
 - FG-AI4A Deliverable: Standardization gaps and roadmap for AI and IoT in digital agriculture
238. ITU-T SG20 established a new Question on Digital agriculture: from smart farm and production to safe and secure consumption. SG20 works on standards related to digital agriculture.
239. ITU, in collaboration with FAO, developed [Module 12 on Digital Agriculture](#) as part of the [Toolkit on Digital Transformation for People-Oriented Cities and Communities](#).
240. ITU and FAO have been collaborating to guide the European Union’s pre-accession countries to meet the EU Digital Agriculture requirements, to support them in their journey to become equal members of the single EU market and implement their agricultural policies under the umbrella of European Common agricultural policy. To do so, ITU and FAO developed the [“Meeting the EU's Digital Agriculture Requirements. A Compendium for Pre-accession Countries”](#).

241. Studies within ITU-R on the development of [IMT 2030](#) are expected to contribute to the delivery of improved E-Agriculture services and opportunities.

Action Line C7: E-Environment



[Related to SDGs:](#) SGD 9 (9.4), SDG 11 (11.6, 11.b), SDG 13 (13.1, 13.3, 13.b), SDG 14, SDG 15



242. The Action Line C7: E-Environment Facilitation Meeting on “Co-designing the environmental dimensions of WSIS +20” was held on 8 July 2025 as part of the WSIS+20 High-Level Event 2025. It was co-organized by ITU, WMO and UNEP. The session reflected on two decades of progress under Action Line C7 on e-environment by sharing practical experiences and policy innovations from Member States and Stakeholders and presented a forward-looking vision for this Action Line under the WSIS+20. For more details on the sessions and the outcomes, please see [here](#).

243. The WSIS Prizes 2025 Winner for the Action Line C7 on E-Environment is: Rapid, accurate and secure production, dissemination and communication of early warning for meteorological disaster, China. Details of the project are available [here](#).

244. The Development sector of the ITU has undertaken several activities falling under the Action Line c7 E-environment, in particular Emergency Telecommunications and e-waste. On the e-waste side the following activities have taken place:

245. E-waste:

- o **E-waste Policy and Regulation**

- o **ITU** published the second edition of the 'Policy practices for e-waste management: Tools for a balanced and fair circular economy'. Based on ITU's experience and lessons learned in e-waste management and circular economy, the toolkit was developed for policymakers and other industry actors. It provides them with a practical and step-by-step guide in establishing an inclusive and fair e-waste management system as enhanced by the concept of extended producer responsibility (EPR). This second edition of the Toolkit has been enhanced to cover all phases of policy and regulatory developments — from initial preparation to stakeholder consultation. This includes details on implementation, internal and external checks, as well as critical success factors. The toolkit sets out specific requirements for national and local government policymakers, encouraging an all-actors approach based on EPR principle for e-waste management.

- o **Creating a Circular Economy for Electronics:** Through its e-waste policy support programme, ITU provided technical assistance to Member States in their development and implementation of national e-waste management regulatory frameworks.

- o **Indonesia:** ITU assisted the Government of Indonesia with the transition of its electronics sector towards circular economy by preparing a high-level roadmap for a possible EPR regulatory framework for the EEE sector. This technical assistance, financially supported by FCDO focuses on the development of a sound regulatory framework for Indonesia, governing all types of electrical and electronic equipment, and based on a financially and administratively sound EPR system for electronics. A public sector consultation workshop was held on 19 and 20 November 2024. A continued in-person technical and strategic consultation was held in February 2025, providing a space for discussion and alignment of the government on a unified vision for a circular EEE sector. A training for policymakers was organized in September 2025 to build capacity of the public sector on circular economy for electronics.
- o **Mongolia:** A project inception meeting was held in July 2025, resulting in the organization of a capacity-building and stakeholder consultation workshop in October 2025 in Mongolia. Public and private sector stakeholders were invited to enhance their knowledge and awareness of the e-waste stream and the EPR policy principle.
- o **Paraguay:** Following consultation workshops held in 2024 with the public and private sectors, ITU organized a pre-validation workshop of the drafts of the Decree and Resolution in Asunción, Paraguay, focusing on the post-consumer management of electrical and electronic equipment (EEE) and EPR. This pre-validation workshop, held on May 23rd, 2025, focused on the presentation for validation of the key proposed regulatory aspects for Paraguay's EPR system. Participants from the public and private sectors, from academia and civil society expressed suggestions and comments on the documents provided and advanced in the process of refining the drafts of the decree and resolution. A capacity-building session to prepare the private sector to the upcoming EPR regulations for EEE in Paraguay was held in Asunción, Paraguay on May 22nd, 2025.
- o **Rwanda:** ITU conducted a mission to Rwanda in November 2024 to follow-up on previous missions and address three focus areas of e-waste management: legal regime, administrative arrangements and financing mechanisms. ITU participated in a validation workshop for regulations on electrical and electronic products and producer compliance, held on March 25th 2025 in Kigali, Rwanda. In October 2025, ITU coordinated a series of meetings to fine tune the implementation details of EPR for electronics in Rwanda.
- o **Thailand:** ITU coordinated and participated in a private sector stakeholder consultation workshop, held in December 2024, to engage the Thai private sector in establishing a legally transparent and appropriately financed system for the environmentally sound management of e-waste in Thailand. Additionally, the ITU organized a workshop to train the Thai private sector on EPR for electronics. A series of bilaterals to better scope the roles and responsibilities and interests of stakeholders was organized between September and 2025.

- o **Zambia:** ITU organized a week of consultations on the implementation of the EPR principle in Zambia for the electronics and electrical sector. Held in October 2025, this week experts and local stakeholders gathered to equip policy-makers with the necessary knowledge and tools to understand EPR and ensure the sustainability of project gains.

- o **Launch of International Knowledge Exchange Initiative:** A new project was signed by the ITU and the Government of Colombia. Titled "International Exchange Initiative on Regulating E-waste and Engaging Tech Companies", the project provides a platform for best practices and lessons learnt for participating countries to grow their knowledge and increase their experiences related to the development and implementation of e-waste regulation. It supports the transition to a circular economy for electronics in six participating countries in Africa, Asia-Pacific and Latin America (Colombia, Dominican Republic, India, Malaysia, Nigeria and South Africa). Under this new project, a first study tour was held in Bogotá, Colombia in October 2025. A follow-up public webinar was held on 30 October 2025, to consolidate lessons learnt during the study tour to Colombia.

- o **International Partnerships and Events:**

ITU participated in a workshop titled "Green Digital Transformation Community of Practices", organized by SmartAfrica, held online on 24th April 2025. The workshop focused on African recycling country profiles as well as the opportunities for improving secondary raw materials value chains. ITU introduced the status of national e-waste/recycling policies and legislation in Africa with a focus on EPR-based take-back systems.

ITU participated in the Lenovo 360 Circle Summit in Geneva, upon invitation by Lenovo's Global Sustainability Director of International Markets and the Global Channel group. ITU participated in key engagement over two days including a speaking role in one of the opening panels.

ITU presented its policy and regulatory support projects in Dominican Republic and Paraguay in a webinar titled "E-waste in Latin America: From Current Challenges to Future Solutions, 17 October 2025" organized in coordination with UNIDO and held on October 17th 2025.

246. Climate Change:

The Telecommunication Development Sector (BDT) of the ITU has undertaken the following activities:

- o **Early warning systems:** ITU is leading Pillar 3 "Warning dissemination and communication" of the UN initiative *Early Warnings for All initiative*. This climate change adaptation measure, announced by the UN Secretary General in March 2022, stipulates that by 2027 every person in the world should be protected by an early warning system. To achieve this goal, ITU is highlighting the opportunities brought by the growth in digital services to effectively reach and deliver alerts to people at risk; especially over mobile cellular networks, which reach a very large

percentage of the population. ITU is working closely with WMO, UNDRR, IFRC and other partners in supporting the UN Global Early Warning Initiative by engaging mobile network operators and regulators, as well as identifying and sharing best practices and expertise. The EW4All initiative has been rolled out in 30 particularly at-risk countries identified, including Small Island Developing States and Least Developed Countries. The [Early Warnings for All Dashboard](#) tracks progress for informing decision-making and measuring success of the initiative. ITU leads the AI Sub-group of EW4All, which brings together the EW4All partners and 130+ members from both private and public sectors. The sub-group: identifies gaps in early warning systems, explores AI-based solutions that respond to country needs, and aims to scale the solutions through country pilots to close gaps and use AI to strengthen early warning systems. One key achievement in 2025, is the AI4Good Global Summit Hackathon and workshop in July 2025, designed to harness the power of AI to address critical gaps in EWS for disasters and extreme weather events. Learn more about the challenge [here](#). One successful example of an AI country pilot is the Early Warning Connectivity Map (EWCM), developed through successful partnership forged between ITU and the Microsoft AI for Good Lab, the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, and Planet Labs. The tool uses AI and satellite imagery to generate high-resolution population density maps. This enables governments and partners to identify the population not covered by digital networks, and to design tailored dissemination strategies and make targeted investments, to ensure that no one is left behind.

o **Monitoring industry emissions, energy use and climate commitments from tech companies:** ITU and the World Benchmarking Alliance launched the 4th edition of the [Greening Digital Companies \(2025\)](#) report on 05 June 2025 via [two online webinars](#) to capture different time zones and was attended by more than 80 participants. This latest assessment tracks GHG emissions, energy usage, and climate commitments from 200 leading digital companies worldwide, offering a critical benchmark for climate ambition and accountability across the ICT sector. The 2025 report with more digital companies setting emission reduction targets, scaling up renewable energy sourcing, and aligning with science-based frameworks. sector emissions are still rising Scope 1 and 2 emissions increased by 1.4% to 297 million tCO₂e, and most emissions remain concentrated in a small group of companies. Scope 3 emissions, especially from supply chains and product use, make up the majority of the sector's footprint. A key trend this year is the rapid expansion of artificial intelligence, which is driving up energy demand and emissions from data centers. Addressing the climate impact of AI will be essential for the sector to achieve its targets. The report was accompanied by a [press release](#). The Greening Digital Companies Report is a leading publication which draws

significant attention to ITU, including through the media. The 2025 release saw more than 350 written mentions in English, German, Spanish, French, Korean, Dutch, Italian, Chinese, Japanese, Russian, Greek, and Vietnamese one week after launch. The estimated views in the first week totalled 383,000 with the report being picked up by a number of international wire services, including Reuters, Keystone, DPA, the UAE News Agency and the Moroccan News Agency, which led to a wide geographical coverage. Requests for additional data and interviews continue to come in from journalists.

- o [The Greening Digital Dashboard](#) is in its second edition having undergone a major revision in 2025 to be more interactive. It enables ITU and partners to monitor the ICT sector's climate impact with greater interactivity, allowing users to explore and compare emissions, energy use and climate targets data between companies and download the open data. By visualizing trends and progress over time, the dashboard supports evidence-based target setting and paves the way for a global ICT GHG emissions database, advancing collective climate action.

- o **Supporting countries to monitor and track ICT sector GHG emissions and energy use:** The [Expert Group on Telecommunication/ICT Indicators \(EGTI\)](#) Subgroup on National Greenhouse Gas Emission Monitoring Indicators was established following the 15th meeting of the Expert Group on Telecommunication/ICT Indicators (EGTI) in Geneva (September 2024). The subgroup was tasked with defining a set of harmonized environmental indicators to support national-level monitoring of the ICT sector's environmental impact. These indicators aim to strengthen countries' capacity to measure and monitor these impacts, enabling them to develop more informed policies. They also contribute to a broader effort by supporting the ITU's work in collecting harmonized country-level data and facilitating meaningful international comparisons. The subgroup's work aligns with ITU's broader strategic objectives, as outlined in Target 2.5 of the ITU Strategic Plan 2024–2027, which seeks to enhance the role of ICTs in climate and environmental action. Six online meetings have been held between April and July 2025 with participants from all ITU regions: Africa (Uganda, South Africa, Zambia), Arab States (Comoros, Egypt), Asia and the Pacific (Malaysia, Philippines), CIS (Azerbaijan), Europe (Cyprus, France, Norway, Portugal, Greece, BEREC), and the Americas (Brazil, British Virgin Islands); the work was chaired by Arcep, France. To inform this work, background research and consultations were conducted by reviewing existing reports, regulatory approaches, and international initiatives relevant to environmental monitoring in the ICT sector. Several presentations were shared by members, including recent work from BEREC, ITU, and Arcep. To better understand country-level realities, the subgroup also developed and circulated a questionnaire to national focal points to gather

information on: existing environmental data collection practices in the ICT sector, national legal and institutional frameworks, and the main challenges encountered in collecting and reporting data. The core output of the subgroup's work is a structured framework of environmental indicators designed to measure the climate and energy footprint of the ICT sector at the national level. This was developed through a series of meetings from April to July, where the group defined a core set of indicators including Scope 1, 2, and 3 emissions, energy use, and climate targets disaggregated by telecom networks, data centers, and end-user devices. The framework defines which actors in the ICT sector should be surveyed for environmental data, based on their activity type, relevance, and national presence. Stakeholders are categorized by sub-sector: telecom networks, data centers, and end-user device manufacturers. The set of environmental indicators are assigned: A priority score for environmental relevance (1 = high relevance, 3 = lower), A priority score for feasibility of data collection (1 = high feasibility/availability, 3 = low). This dual-priority system allows countries to progressively build their data collection capacity by focusing first on indicators that are both impactful and achievable, while planning for the inclusion of more complex indicators over time. The subgroup outcome report underwent Membership review and was presented to EGTI on 25 September during the session [Developing new indicators: measuring the environmental footprint of key players in the ICT sector](#). The outcome [Report of the EGTI Subgroup](#) on National Greenhouse Gas Emission Monitoring Indicators for the ICT Sector is available.

o Together with the World Bank and Arcep, CET published the '[Measuring National ICT Sector Climate Impact: Arcep Case Study](#)' in March 2025. An [online launched event](#) was held on 12 March 2025 where more than 150 people attended. This resource, using the French ICT regulator as a case study, serves as a model for ICT regulators by detailing its approach to data collection, legal adaptations, surveyed sectors, and report outcomes. The case study builds on previous ITU and World Bank research launched in March 2024 - 'Measuring the Emissions and Energy Footprint of the ICT Sector: Implications for Climate Action' work to improve understanding of the digital sector's environmental impact. The report provides a detailed account of how Arcep developed a legal and collaborative framework to collect and analyze environmental data from across the ICT sector, including telecom operators, device manufacturers, and data centers. Key lessons highlight the importance of government support, stakeholder engagement, phased data expansion, and data-driven regulation. The Arcep experience is now recognized as a blueprint for regulators worldwide, demonstrating how to scale from telecom sector data to a holistic approach covering the entire digital ecosystem.

o Under the '[Advancing Green Digital Action Towards a Net-Zero Digital Sector in the Philippines and Tanzania](#)' project which is funded by the Government of the Republic of Korea, MSIT. The 2 year project runs from January 2025 – December 2026. The project aims to harmonize GHG emissions and energy data collection in the digital sector, supporting ICT regulators in Tanzania and the Philippines through capacity-building and the development of strategies for decarbonization and net-zero digital transitions. Q1 activities included: Planning and engagement of focal points, Creation of a roster of experts to support implementation, with applications and selection process for a few consultants, Finalisation of specifications and start of the procurement for a dashboard on Greening Digital to visualize ICT climate data and support science-based targets, with country-level data to be included later, design of an ITU Academy e-learning course concept, Development of an ArcGIS StoryMap showcasing the project and broader green digital activities, creation of an [impact blog](#) for the project. As part of the global component for this project, a new e-learning course is under development which will equip national ICT stakeholders with practical knowledge and tools for GHG monitoring and reporting, supporting broader uptake of international standards.

o **Supporting countries in developing green ICT strategies and policies, including through the provision of tools, resources and training:** A StoryMap has been developed to highlight BDT's climate change programme of work on Advancing Green Digital Transformation Towards a Net-Zero Sector. ITU, in collaboration with GIZ and the World Bank, launched an e-learning course '[Green data centres for policy-makers](#)' on 13 August 2025 on ITU Academy and GIZ's atingi platform. At the Global Symposium for Regulators 2025, an article on [Monitoring sustainability: Incorporating ESG into ICT policy making and regulation](#), produced by ITU and released during the [Global Symposium for Regulators 2025 \(GSR-25\)](#) through the [Digital Regulation Platform](#), offers guidance for ICT regulators to develop and integrate ESG frameworks into policy. Many ICT regulators and policy makers already collect operational and financial data on the ICT sector. **International events:** CET participated in the following climate related events in 2025:

- Organised [Measuring the Environmental Impact of the ICT Sector: Arcep Case Study – France](#), 12 March 2025, 14:00 – 15:30 CET, online.
- Speaker at UNI Global Union Annual Committee Meeting on Greening Digital Companies report, 09 April 2025, 10:45 – 12:00 CET, Nyon, Switzerland.
- Panellist at the Green Digital Action Summit, 'Targets, Transparency and Reporting: Moving the Digital Tech Sector Towards Net-Zero' & Moderator

- for 'Empowering the Future – Green AI Skills for a Sustainable Workforce', 23 May 2025, GITEX Europe, Berlin, Germany.
- Organised [ITU - WBA Webinar on Greening Digital Companies 2025: Monitoring emissions and climate commitments](#), 05 June 2025, 09:00-10:15 CEST and 18:00-19:15 CEST, online.
 - Panellist at the Lenovo 360 Circle Summit 2025, 'Powering the Future: AI-Driven Energy Efficiency and Resource Management in Data Centers', 18 June 2025, 12:10 – 12:35, Geneva, Switzerland.
 - Panellist at WSIS+20 High-Level Event, Digital Solutions for Sustainability, 'Exploring the Environmental Footprint of the ICT Sector – From Standardized Measurement to Transition Plans', 08 July, 2025, 15:05–15:30 CEST, Room F, Palexpo, Geneva, Switzerland.
 - Speaker and partnership building, AmazonOn, Brazil, 19 – 21 August 2025, Brasilia and Manaus, Brazil.
 - Speaker and session co-organiser at the 16th meeting of the EGTI, [Developing new indicators: measuring the environmental footprint of key players in the ICT sector](#), 25 September 2025, 14:30 – 15:30, Geneva, Switzerland.
- Driving the Digital-Climate Agenda at UNGA and Climate Week New York, 19 – 25 September 2025. Took part in a series of high-profile discussions at the intersection of digital transformation and climate action, speaking engagements included:
 - o Green Digital Infrastructure (Nigeria), 19 September: Joined the panel on advancing green, resilient ICT infrastructure.
 - o Solutions Dialogue on DPI for Climate, 22 September: Contributed to the discussion on leveraging interoperable digital public infrastructure to drive climate-smart development as a roundtable speaker.
 - o CODES Roundtable, 23 September: Shared the latest findings on AI standardization and policy solutions to address environmental impacts.
 - o Devex & Vodafone “Future Ready” Dialogue, 23 September: Led a table discussion on designing digital tools for practical, scalable adaptation in a +1.5°C world.

247. International Standards:

The Standardization sector of the ITU has undertaken several activities falling under the WSIS Action Line C7 e-Environment.

[ITU-T Study Group 5 on Environment, climate action, circular economy and electromagnetic fields](#) is responsible for developing international standards (**ITU-T Recommendations**), supplements and technical reports, serving as **the lead expert group on**: Electromagnetic compatibility (EMC), resistibility and lightning protection, soft error caused by particle radiations, Human exposure to electromagnetic fields (EMF), Circular economy and e-waste management, ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions.

ITU-T SG5 standards provide policymakers, industry leaders and ICT stakeholders with the tools to adopt sustainable solutions while ensuring technological resilience. SG5's work focuses on:

- **EMF & EMC Protection:** Ensuring public safety by developing standards to assess human exposure to EMF and to verify compliance with the World Health Organization recommended human exposure guidelines and limits, and enhance the reliability and safety of telecommunication/ICT networks by providing requirements on resistibility and electromagnetic compatibility, and addressing the effect of particle radiation.
- **Environmentally Efficient ICT Infrastructure:** Establishing standards for building energy-efficient and environmentally sustainable ICT infrastructure.
- **Environmental Impact & GHG Emissions:** Developing assessment methodologies and evaluating the environmental footprint of telecommunications/ICTs (including new and emerging), including their impact on climate, biodiversity, and industries with greenhouse gas (GHG) emissions.
- **Climate Action & Resilient ICTs:** Leveraging ICTs to reduce climate impact, support and accelerate climate change adaptation, and climate action across various sectors particularly industrial sector.
- **Circular Economy & E-Waste Management:** Developing standards to minimize e-waste, enhance material re-use, and transition towards a circular economy.

To align its standards with international best practices, ITU-T SG5 collaborates closely with **major Standards Development Organizations (SDOs)**, including ETSI (with the development of technically aligned standards), ISO, IEC, 3GPP and IEEE. ITU-T SG5 also partners with **UN agencies** such as UNFCCC, UNEP, UNIDO, UNECE and UNESCO.

The following Recommendations were developed:

- [ITU-T L.1004 “Universal Fast Charging Solution for mobile terminals”](#) defines the overall framework of the solution for mobile terminals and the role of each part. The communication flow between each part of the UFCS and the key functions in it are also described. The Recommendation specifies requirements for various aspects such as system, safety, electromagnetic compatibility, material, eco-environment and energy efficiency. The higher interoperability brings important environmental benefits including reduced electronic waste and use of materials and energy, a smaller carbon footprint through lesser use of energy and materials to produce chargers and being able to sell devices without a charger.
- [ITU-T L.1011 “Guidelines for the durability assessment of Lithium-ion Batteries”](#) describes the importance of improving the durability of lithium-ion batteries at different stages of the product life cycle. Durability assessment method of lithium-ion batteries is given, including specific suggestions for improving durability in different evaluation dimensions.

Finally, through the development of product durability evaluation indicators and grading, it provides specific guidance references for users to assess the durability of lithium-ion battery using this Recommendation.

- **ITU-T L.1017 “Environmental performance scoring of smartphones”:** provides a standardized method to measure and assess the environmental performance of smartphones. It includes a method to evaluate an aggregate score, reflecting the overall environmental performance and considering material efficiency and life cycle assessment (LCA) aspects. This Recommendation aims to evaluate the following attributes of a smartphone:
 - Durability.
 - Reparability, reusability and upgradeability.
 - Recyclability and recoverability.
 - Use of hazardous or restricted substances.
 - Use of recycled materials.
 - Characteristics of the product packaging.
 - Environmental impact considerations.
- **ITU-T L.1018 “Specification for the durability assessment of mobile telecommunication terminals”** describes the importance of improving the durability of mobile telecommunication terminals at different stages of the product life cycle. A durability assessment method for mobile telecommunication terminals is given, including specific suggestions for improving durability in different evaluation dimensions. Finally, through the development of product durability evaluation indicators and grading, this Recommendation provides specific guidance references for users to assess the durability of mobile telecommunication terminals.
- **ITU-T L.1025 “Assessment of material efficiency of information and communication technology network infrastructure goods – Server and data storage product secure data deletion functionality”** addresses the requirements on secure data deletion. It aims to give a valid and compliant method to assess if this specific requirement on data deletion has been met.
- **ITU-T L.1028 “Indicator for global-warming-potential impact as a function of ICT-equipment operating-lifetime extension”** defines the ratio UER10 as an indicator for impact of ICT-equipment operating-lifetime extension on the resulting GWP. UER10 can help the practitioner to get an idea of the relative significance of use stage GHG emissions vs embodied emissions of a product over its lifetime.
- **ITU-T L.1037 “Guidelines on the collection, pre-treatment, dismantling, valorization and final disposal of WEEE”** provides a comprehensive framework for the collection, transportation, storage, dismantling, valorization, and final disposal of WEEE in a safe and environmentally sound manner, as well as for improving the valorization of WEEE in developing

countries. It aims to improve recycling rates and resource recovery, particularly in developing countries, while supporting stakeholders in making environmentally conscious decisions and facilitating sustainable e-waste management.

- **ITU-T L.1071 “A model for digital product passport information on sustainability and circularity”** aims to define an information model to describe environmental sustainability and circularity information details about ICT goods (products) in a digital form to be part of a digital product passport as environmental information, that can be compared with information requirements in relevant environmental sustainability and circularity standards, specifically ETSI standards and ITU-T recommendations. The information details can represent products at any time of their circular lifespan: design, manufacturing, use, hardware changes, and final recycling as e-waste. Several product-related standards can be expressed as a list of environmental information templates. The matching of product information to standards information for checking the alignment of products with different standards when relevant.
- **ITU-T L.1080 “Assessment of material efficiency of information and communication technology network infrastructure goods – Server and data storage product availability of firmware and of security updates to firmware”** establishes the means for the verification of compliance with the requirements for the availability of firmware and of security updates to the firmware for servers and data storage products.
- **ITU-T L.1081 “Good practices for the sanitization of the information media in end-of-life ICT user devices”** aims to provide good practices for the sanitization of the information media in end-of-life information and communication technology (ICT) user devices. For this purpose, it describes the necessary procedures and practices for implementing information storage media sanitization for waste electrical and electronic equipment at end-of-life and in reconditioning, refurbishment and recycling facilities. This Recommendation addresses end-of-life ICT user devices, implementing circular practices to return information storage media to a working condition for reuse, known as refunctionalization. This Recommendation applies to personal ICT user devices such as desktop and laptop computers, notebooks, tablets or terminals such as smartphones, and information media such as discs, solid-state drives, and universal serial bus (USB) storage.
- **ITU-T L.1260 “Reference Model of a Factory Energy Management System”** presents a reference model for a factory energy management system that is operated to efficiently manage energy consumed in the factory. A factory energy management system should provide functions such as data collection and control, data processing and analysis, energy services, system management, and security.

- **ITU-T L.1310 (revised) “Energy efficiency metrics and measurement methods for telecommunication equipment”** specifies the energy efficiency metrics test procedures, methodologies and measurement profiles required to assess the energy efficiency of telecommunication equipment. Energy efficiency metrics and measurement methods are defined for telecommunication network equipment and small networking equipment. These metrics allow for the comparison of equipment within the same class, i.e., equipment using the same technologies. The comparison of equipment in different classes is out of the scope of this Recommendation.
- **ITU-T L.1311 “Energy Efficiency measurement methodology and metrics for heterogeneous servers”** contains an energy efficiency methodology definition and metrics definition for heterogeneous servers.
- **ITU-T L.1327 “Guidelines on the selection of cooling technologies for data centres in multiple scenarios”** describes a universal data centre-cooling technology selection method at its current industry development stage by matching detailed analysis of such technology and typical application scenarios.
- **ITU-T L.1328 “Specification for waste heat reuse in telecommunication rooms and data centers”** describes the use cases of waste heat reuse and defines the key metrics of waste heat recovery and reuse. Further, the measurement methodology including the calculation method for the defined key metrics is also described.
- **ITU-T L.1384 “Implementation of a virtual micro power station at base station sites”** provides technical specification on how to utilize energy storage system installed in base stations sites to realize a coordination optimization to participate in power grid dispatching as a virtual power plant. This solution helps site owner to build a virtual micro power station with telecommunication base station energy storage system, in this way, site owners can significantly reduce the construction and operation cost of power feeding system for the base station sites, contribute to reduce the carbon emissions of energy sector improving the integration of renewable sources in grid, and achieve optimal energy scheduling.
- **ITU-T L.1395 “Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks) - Generic Interface”** applies to monitoring and control of Infrastructure Environment i.e. power, cooling and building environment systems for telecommunication centres and access network locations; also, the monitoring of energy and environmental parameters: Power Energy Environmental (PEE) parameters for ICT equipment in telecommunications sites or datacenter or customer premises are considered.
- **ITU-T L.1396 “Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in**

Telecommunication Networks) - ICT equipment power, energy and environmental parameters monitoring information model” defines the measurement of electrical power and energy consumption of ICT equipment as well as environmental parameters (temperature, hygrometry) in order to improve energy monitoring and to correlate the power consumption to equipment operation activity (telecom traffic, computation, etc.).

- **ITU-T L.1397 “Monitoring and control interface for infrastructure equipment (Power, Cooling and environment systems used in telecommunication networks) - Battery system with integrated control and monitoring information model”** defines monitored and controlled battery system architectures and the minimum set of exchanged information required at the interface, described in "natural language" in text tables. Battery autonomous protective circuitry without communication, self-protection.
- **ITU-T L.1410 “Methodology for environmental life cycle assessments of information and communication technology goods, networks and services (revised)”** deals with environmental life cycle assessments (LCAs) of information and communication technology (ICT) goods, networks and services. It is organized in two parts: • Part I: ICT life cycle assessment: framework and guidance • Part II: “Comparative analysis between ICT and reference product system (Baseline scenario); framework and guidance”. Part I deals with the life cycle assessment (LCA) methodology applied to ICT goods, networks and services. Part II deals with comparative analysis based on LCA results of an ICT goods, networks and services product system, and a reference product system.
- **ITU-T L.1472 “Requirements for the creation of an ITU database on energy consumption and GHG emissions of the ICT sector” (under approval)** provides the requirements to support the creation of an ITU database on GHG emissions of the Global ICT sector at worldwide level and at a national level. The guidance is intended to support ITU in establishing such a database.
- **ITU-T L.1490 “Framework and Functional Requirements of Greenhouse Gas Emissions Management System using Digital Technology for Public Sector”** proposes a GHG emissions management using ICT for public sector, and specifies the requirements for system construction principles, framework and functional requirements.
- **ITU-T L.1491 “Measurement methodology and best practices for decarbonization of industrial park in support of net zero”** describes the measurement methodology and best practices for decarbonization of industrial park in support of net zero. By describing the GHG emission accounting methods for industrial parks, this Recommendation identifies the assessment process and ICT tools required for net zero achievement in

industrial parks. Finally, this Recommendation provides practical guidance to achieve net zero goal in industrial parks.

- **ITU-T L.1510 “Environmental Key Performance Indicators for Digital Infrastructure Adapting to Climate Change”** defines key performance indicators (KPIs) for assessing the environmental impact of digital infrastructures, including greenhouse gas emissions, water usage, power supply, ecosystem effects, waste management, and indirect enablement of GHG emission reduction.
- **ITU-T L.1621 “Key Performance Indicators for circular cities”** outlines the key performance indicators (KPIs) in the context of circular cities (CC). The main elements examined in this Recommendation are: The dimensions of circular city and the determination of key performance indicators that measure circularity in cities.
- **ITU-T L.1632 “Identification method for building infrastructure equipment in a sustainable city”** defines the identification method for equipment at the building infrastructure which improves the manageability and interworking among facilities at the building. The identification method includes the identifier structure and identifier management procedure which are easily recognizable, understandable mapping between identifier and device, consistency in the equipment category.

248. The ITU/WMO/UNEP Focus Group on Artificial Intelligence for Natural Disaster Management ([FG-AI4NDM](#)) was established in December 2020 to help lay the groundwork for best practices in the use of AI for: assisting with data collection and handling, improving modelling across spatiotemporal scales, and providing effective communication.

249. In particular on Smart Sustainable Cities and Internet of Things, have developed important standards and recommendations in the area, please see the activities in detail below.

250. Smart Sustainable Cities and Climate Change (Past Events):

Events and Webinars on IoT, Digital Twins, Smart Sustainable Cities, AI and Virtual Worlds, Data Management and Digital Transformation

- [Special session on U4SSC](#) (Barcelona, 5 November 2025)
- [Global DPI Summit Session on Cities Reimagined: DPI as the Engine of Urban Progress](#) (Cape Town, 4 November 2025)
- [Session on Citiverse Rising: Virtual Worlds and AI Agents for Urban Transformation](#) (Barcelona, 4 November 2025)
- [Annual Assembly of the Global Initiative on Virtual Worlds and AI – Discovering the Citiverse](#) (Valencia, 3 November 2025)
- [9th U4SSC meeting](#) (31 October 2025)
- [Webinar on “Empowering lives through people-centred smart cities”](#) (31 October 2025)

III. Overview of ITU activities and projects undertaken since 2023 in the context of the implementation of WSIS outcomes, also related to the 2030 agenda for sustainable development.

- [Forum on Connected by Design: Building Inclusive Digital Infrastructure for Future-Ready Cities](#) (Geneva, 15 September 2025)
- [AI for Good Workshop on AI & virtual worlds: Building the cities and governments of tomorrow](#) (Geneva, 9 July 2025)
- [WSIS Session on Leaving No One Behind in the Citiverse](#) (Geneva, 8 July 2025)
- [2nd UN Virtual Worlds Day: Delivering the Pact for the Future with AI-Powered Virtual Worlds](#) (Turin, 11-12 June 2025)
- [Webinar – Digital inclusion and accessibility: Leaving no one behind in virtual worlds and the citiverse](#) (15 May 2025)
- [Forum on Sustainable Digital Transformation in Latin America](#) (Santo Domingo, 8 May 2025)
- [STI Forum Side event on Artificial Intelligence & Virtual Worlds: Innovating the Future of Work and Economic Growth to advance the SDGs](#) (6 May 2025)
- [ITU and ATU Webinar – Shaping Africa’s Digital Future: Governance in the Metaverse and Virtual Worlds](#) (25 February 2025)
- [Quantum Leaps: Pioneering the Future with Quantum Computing](#) (28 November 2024)

Events and Webinars on ICTs, the Environment and Climate Change, EMFs (Past and Upcoming events)

- [15th Symposium on ICT, Environment, Climate Change and Circular Economy](#), Ouagadougou, Burkina Faso, 7–9 May 2024
- [ITU Side Event to 2024 STI Forum: Leveraging Data for Climate Action: Insights from the ICT Sector](#), Virtual, 10 May 2024.
- [ITU Regional Workshop on EMF Harmony: Balancing Connectivity, Safety and Tower Location Selection in the Arab Region](#), Muscat-Sultane, Oman, 13–16 May 2024
- [DTD Ask the expert session: Assessing the circularity of ICT goods](#), Virtual, 22 May 2024.
- [WSIS session on Traceability of E-Waste and the Use of Digital Product Passports for ICT Goods](#), Virtual, 30 May 2024.
- [ITU-ETSI Symposium on ICT Sustainability: Standards Driving Environmental Innovation](#), (Geneva, 11–12 December 2024)
- [IEEE-ITU Symposium on Achieving Climate Resilience](#) - Towards a Technology Roadmap: Leveraging Policy, Standards, Skills and Finance, (Geneva, 12–13 December 2024)
- [Side Event to 2025 BRS COPs: Towards a Global Framework for Digital Product Information Systems: Enhancing Sustainability and Traceability for the ICT sector](#), (Geneva, 30 April 2025)
- [Forum on Sustainable Digital Transformation in Latin America](#), (Santo Domingo, Dominican Republic, 8 May 2025)

- [WSIS Side event on: Environment special track: Digital Solutions for Sustainability: ICT's Role in GHG Reduction and Biodiversity Protection](#), Tuesday, 8 July 2025
- [WSIS Side event on: From data to impact: Digital Product Information Systems and the importance of traceability for global environmental governance](#), Tuesday, 8 July 2025
- Workshop on [Navigating the Intersect of AI, Environment and Energy for a Sustainable Future](#): Thursday, 10 July 2025, Geneva, Switzerland
- A [Global Portal on Environment and Smart Sustainable Cities](#) is being maintained and highlights the latest external resources related to six distinct topics, including; smart sustainable cities; cities' actions to tackle Covid-19; energy efficient ICTs; climate change; e-waste management and circular economy; and frontier technologies (e.g. AI, IoT, blockchain). This Global Portal also provides link to ITU's IoT and SC&C Standards Roadmap.

The following reports have been published:

- [Management of waste electrical and electronic equipment in Latin America: Current situation and outlook](#) (available in English and Spanish)
- [Measuring What Matters: How to Assess AI's Environmental Impact](#)
- [White Paper on the Safety of lithium-ion battery applications in data centers](#)
- [White Paper on Lithium Batteries for Telecom Sites](#)
- [Standardization for AI Environmental Sustainability](#)
- [AI and the Environment - 2024 Report](#)

251. A Global Portal on Environment and smart sustainable cities highlights the latest external resources related to six distinct topics, including; smart sustainable cities; cities' actions to tackle Covid-19; energy efficient ICTs; climate change; e-waste management and circular economy; and frontier technologies (e.g. AI, IoT, blockchain).

Action Line C7: E-Science



Related to the SDGs: SDG 1 (1.5) , SDG 4 (4.7) , SDG 6 (6.1, 6.a) , SDG 7 (7.a), SDG 13 (13.1, 13.2, 13.3), SDG 14 (14.a), SDG 15 (15.9) , SDG 17 (17.6, 17.7)



252. UNESCO organised the WSIS Action Line Facilitation Meeting C7: E-Science on 11 July 2025 under the topic of “e-Science for Inclusive Futures: Access, Collaboration, and Foresight for the Next Decade”. For more details on the sessions and the outcomes, please see [here](#).

253. The WSIS Prizes 2025 Winner for the Action Line C7 on E-Science is: Improving brain proteostasis as a strategy to reduce the adverse effects of aging on the cognitive decline of the elderly, Chile. Details of the project are available [here](#).
254. ITU is one of the co-facilitators together with UNESCO, UNDESA and Regional Commissions, ILO, ITC, FAO, UPU, UNEP, WMO, UNCTAD, WHO, etc. for the eight areas of ICT applications that are covered by WSIS Action Line C7. ITU is running the ITU Academy for trainings on ICT related issues. (<https://academy.itu.int/>).

Action Line C7: E-Learning



[Related to the SDGs: SDG 4](#)



255. As the co-facilitator of Action Line C7 on E-Learning, UNESCO organised a WSIS Action Line Facilitation Meeting at the WSIS+20 High-Level Event 2025 on 7 July 2025. For more details on the sessions and the outcomes, please see [here](#).
256. The WSIS Prizes 2025 Winner for the Action Line C7 on E-Learning is: Madrasati Learning Management System, Saudi Arabia. Details of the project are available [here](#).
257. As the lead agent for all ITU capacity building activities, the ITU Academy continues to produce publications as part of its main deliverables. Some activities on curriculum development are available on the following link: <https://academy.itu.int/index.php/main-activities/curriculum-development>.

Action Line C7: E-Employment



[Related to the SDGs: SDG 4 and SDG 8](#)



258. The Action Line C7: E-Employment Facilitation Meeting, co-organized by ILO and ITU, was held on 9 July 2025. The topic of the session was “Emerging technologies in the world of work: Addressing challenges through digital skills”. For more details on the sessions and the outcomes, please see [here](#).
259. The WSIS Prizes 2025 Winner in category C7: e-Employment is: Graduates Employment Ranking, Azerbaijan . Details of the project are available [here](#).

Action Line C7: E-Business



Related to the SDGs: SDG 1 (1.4), SDG 2 (2.3), SDG 5 (5.b), SDG 8 (8.3, 8.9, 8.10), SDG 9 (9.3), SDG 17 (17.11)



260. The WSIS Action Line C7 E-Business Facilitation Meeting was held 8 July 2025 at the WSIS+20 High-Level Event 2025. The topic of the meeting was “Building an inclusive digital economy: the role of the WSIS e-business action line and the Global Digital Compact”. It was organised by UNCTAD (United Nations Conference on Trade and Development), the ITC (International Trade Centre) and the Universal Postal Union (UPU). This session continued the discussion on the WSIS+20 High-Level Event 2024, further exploring how the Global Digital Compact (GDC) impacts the WSIS action line on e-business—its scope and the multistakeholder approach. It also addressed how UN agencies can collaborate effectively to prevent siloed efforts, ensuring that the implementation of the WSIS action line contributes to both the Sustainable Development Goals and the objectives of the GDC. For more details on the sessions and the outcomes, please see [here](#).
261. The WSIS Prizes 2025 Winner for the Action Line C7 on E-Business is: From Weeks to Minutes: How Occidental Mindoro Revolutionized Business Permitting, the Philippines. Details of the project are available [here](#).

Action Line C8: Cultural diversity and identity, linguistic diversity and local content



Related to SDGs: SDG 2, SDG 4 (4.7), SDG 6 (6.b), SDG 8 (8.3, 8.9), SDG 11 (11.4), SDG 12 (12.b)



262. The WSIS Action Line C8 Facilitation Meeting was held on 8 July 2025 on the topic of "Multilingualism in the Digital Age: Inclusive Strategies on Cultural Diversity for a People-Centered Information Society". It was organised by UNESCO as the lead facilitator of this Action Line. For more details on the sessions and the outcomes, please see [here](#).
263. The WSIS Prizes 2025 Winner for the Action Line C8 is: Empowering Youth Through Digital Innovation: Enhancing Capacity, Opportunities, and Participation in Civic Life, Indonesia. Details of the project are available [here](#).
264. Since 2005, the ITU-D Digital Inclusion group has developed a capacity building programme for indigenous communities. Developed in collaboration with El Fondo para el Desarrollo de los Pueblos Indígenas de América Latina y El Caribe (FILAC), the objective is to empower indigenous people and communities through technology and

thus support their educational, social, and economic development, and to contribute to the self-sustainability of indigenous communities and their cultural legacy. Several training programmes have been organised, which benefited more than thousands of indigenous leaders from Latin America and the Caribbean. Many communities have benefited from trainings on innovative communication tools for strengthening ICT knowledge of indigenous communities - with a special focus on how to develop, manage and operate an indigenous community radio network, and other blended trainings such as the Training Programme for Technical Promoters in Indigenous Communities for the Generation, Development and Maintenance of Communication and Broadcasting Network Technologies. More information is available here: <https://www.itu.int/en/ITU-D/Digital-Inclusion/Indigenous-Peoples/Pages/default.aspx>.

Action Line C9: Media



Related to the SDGs: SDG 5 (5.b), SDG 9 (9.c), SDG 12 (12.8), SDG 16 (16.10)



265. The WSIS Action Line C9: Media meeting was held on 8 July 2025 organised by UNESCO. The topic of the meeting was “Towards a Resilient Information Ecosystem”. For more details on the sessions and the outcomes, please see [here](#).
266. The WSIS Prizes 2025 Winner for the Action Line C9 is: Girls Speak Out, Zimbabwe. Details of the project are available [here](#).
267. A number of recommendations relevant to providing access to ICTs through terrestrial and satellite radiocommunication and broadcasting infrastructures have been established, and are under study currently, broadcasting infrastructures are particularly relevant in developing countries and/or underserved areas such as remote and sparsely populated areas.
268. Moreover, ITU-T carried out various studies for Internet Protocol TV (IPTV) that will enable enhanced, media rich delivery of content to users around the world, as well as Next Generation Networks (NGN) to reduce international imbalances affecting the media, particularly as regards infrastructure and technical resources. ITU is also working to enhance accessibility features of audiovisual media delivered by a number of delivery systems through the [IRG-AVA](#).
269. ITU-T Study Group 16 approved the following standards:
- o **ITU-T H.264 (v15) (revised) “Advanced video coding for generic audiovisual services” (under approval)** specifies additional SEI messages for the neural-network post-filter characteristics, neural-network post-filter activation, and phase indication (through referencing to Rec. ITU-T H.274 | ISO/IEC 23002??),

additional colour type identifiers, and miscellaneous minor corrections and clarifications.

- o **ITU-T H.265 (v9) (revised) “High efficiency video coding”** represents an evolution of the existing video coding Recommendations (ITU-T H.261, ITU-T H.262, ITU-T H.263 and ITU-T H.264) and was developed in response to the growing need for higher compression of moving pictures for various applications such as Internet streaming, communication, videoconferencing, digital storage media and television broadcasting. It is also designed to enable the use of the coded video representation in a flexible manner for a wide variety of network environments. The use of this Recommendation | International Standard allows motion video to be manipulated as a form of computer data and to be stored on various storage media, transmitted and received over existing and future networks and distributed on existing and future broadcasting channels. This revision adds the specification of additional levels (levels 6.3, 7, 7.1, and 7.2), the specification of level 8.5 for the video profiles, and also includes corrections to various minor defects in the prior content of the Specification. This Recommendation | International Standard was developed jointly with ISO/IEC JTC 1/SC 29 and corresponds in a technically aligned manner to ISO/IEC 23008-2.
- o **ITU-T H.265 (V10) “High efficiency video coding” (under approval)** represents an evolution of the existing video coding Recommendations (ITU-T H.261, ITU-T H.262, ITU-T H.263 and ITU-T H.264) and was developed in response to the growing need for higher compression of moving pictures for various applications such as Internet streaming, communication, videoconferencing, digital storage media and television broadcasting. It is also designed to enable the use of the coded video representation in a flexible manner for a wide variety of network environments. The use of this Recommendation | International Standard allows motion video to be manipulated as a form of computer data and to be stored on various storage media, transmitted and received over existing and future networks and distributed on existing and future broadcasting channels.
- o **ITU-T H.266 (V3) (revised) “Versatile video coding”** specifies a video coding technology known as Versatile Video Coding and it has been designed with two primary goals. The first of these is to specify a video coding technology with a compression capability that is substantially beyond that of the prior generations of such standards, and the second is for this technology to be highly versatile for effective use in a broadened range of applications than that addressed by prior standards. Some key application areas for the use of this standard particularly include ultra-high-definition video (e.g., with 3840×2160 or 7620×4320 picture resolution and bit depth of 10 bits as specified in Rec. ITU-R BT.2100), video with a high dynamic range and wide colour gamut (e.g., with the perceptual quantization or hybrid log-gamma transfer characteristics specified in Rec. ITU-R BT.2100), and video for immersive media applications such as 360° omnidirectional video projected using a common projection

format such as the equirectangular or cubemap projection formats, in addition to the applications that have commonly been addressed by prior video coding standards.

- o [ITU-T H.266.1 \(V2\) \(revised\) “Conformance specification for ITU-T H.266 versatile video coding”](#) specifies tests for (non-exhaustive) testing to verify whether bitstreams and decoders meet the normative requirements specified in ITU-T H.266 | ISO/IEC 23090-3 versatile video coding (VVC). The bitstreams provided with this document correspond to the 04/2022 (V2) edition of Rec. ITU-T H.266. Relative to the previous edition, this version adds bitstreams for the 12-bit and 16-bit profiles that were added in the second edition of Rec. ITU-T H.266. This draft new Recommendation was developed collaboratively with ISO/IEC JTC 1/SC 29, and corresponds with ISO/IEC 23090-15 as technically aligned twin text.
- o [ITU-T H.266 \(V2\) \(revised\) “Reference software for ITU-T H.266 versatile video coding”](#) provides reference software for Rec. ITU-T H.266 | ISO/IEC 23090-3 "Versatile video coding" and corresponds to the 3rd edition of Rec. ITU-T H.266. The reference software includes both encoder and decoder functionality. Reference software is useful in aiding users of a video coding standard to establish and test conformance and interoperability, and to educate users and demonstrate the capabilities of the standard. For these purposes, the accompanying software is provided as an aid for the study and implementation of Rec. ITU-T H.266 "Versatile video coding". This Recommendation was developed collaboratively with ISO/IEC JTC 1, Information technology, Subcommittee SC 29, Coding of audio, picture, multimedia and hypermedia information, and corresponds with ISO/IEC 23090-16 as technically aligned twin text.
- o [ITU-T H.705.1 “Layered specification for the IPTV service platform functional architecture based on open service capabilities”](#) describes a layered architecture of IPTV service platform intended to provide open service capabilities for diversified IPTV services. In comparison with the high-level IPTV functional architecture defined in Recommendation ITU-T Y.1910, the layered architecture decouples service logic from data resource and decompose the functions of IPTV service platform into more granular modules. This recommendation specifies the fine-grained functional modules and reference points, by considering the aspects of service offering and operational management. It also defines typical procedural flows on content preparation, service presentation and content consumption in appendices. This recommendation provides reference for IPTV service providers to construct the open platform of IPTV services and enables automatic deployment and fast iteration of multimedia applications in the platform. It's of benefit to promote service capability of IPTV and further enhance user experience on using diversified IPTV services.
- o [ITU-T H.705.2 “Requirements for live streaming systems based on QUIC”](#) specifies the requirements of a live streaming system to utilize QUIC transport

protocol to improve its delivery performance and security. It also describes the procedures and framework for QUIC-based live streaming system to provide unicast or multicast service encapsulating in QUIC protocol. With this Recommendation, a live streaming service provider can gain understanding of how to utilize QUIC protocol to provide unicast or multicast live streaming media service. With QUIC transport protocol, the services will have lower connection establishment and delivery delay, enhanced delivery performance, and security insurance.

- o [ITU-T H.705.3 “Requirements and architecture for open IPTV multicast service”](#) specifies the requirements and the referenced architecture of the open IPTV multicast service. In this Recommendation, two solutions are introduced for different scenarios: a dedicated open IPTV multicast service system solution and an interface solution for exposing IPTV multicast network capability. The related functional components, requirements and the reference points are also defined accordingly. With this Recommendation, IPTV service providers are able to expose their dedicated multicast network capability to the third parties so that the OTT live broadcast service deployed on the public Internet could improve its QoE by taking advantage of the dedicated multicast network. Furthermore, new "live +" service may be developed based on the open multicast service defined in this Recommendation.
- o [ITU-T H.725 “IPTV Terminal Device: Virtualized model”](#) specifies the functionalities of virtualized IPTV terminal device (IPTV TD). Virtualized IPTV TD divides the IPTV terminal function (ITF) into 3 parts: physical terminal (PT), function platform (FP) and logic subscriber link (LSL). It identifies key features, functional components, service procedures of virtualized IPTV TD. Functionality partition of physical terminal (PT), function platform (FP) and logic subscriber link (LSL) is also included in this Recommendation. With this Recommendation, IPTV service providers are able to deploy new IPTV services with lower costs of IPTV terminals and in a more flexible way by following the architecture of virtualized IPTV TD defined in this Recommendation.
- o [ITU-T H.741.5 “Application event handling: Overall aspects of personalized IPTV services”](#): A personalized IPTV service is an example of application event handling. With the end-user’s permission, service providers are allowed to provide personalized service, such as contents recommendation, personalized user interface, personalized advertisement and some interactive services. Application can be realized based on the existing IPTV architecture to help in providing various kinds of IPTV personalized services. This work item is intended to study the requirement of personalized IPTV service and describe some use cases.

270. During WTDC-14 Digital broadcasting has been identified as one of the regional initiatives in several regions, and ITU members have recognized the importance of managing the transition smoothly. ITU, in cooperation with Korea, Japan, and Australia, has provided assistance on Digital Broadcasting Transition with updating Guidelines for roadmap development for world-wide, and developed roadmaps for

Afghanistan, Fiji, Indonesia, Lao PDR, Solomon Islands, Vietnam, Vanuatu, Guyana, Gabon, Democratic Republic of the Congo, Equatorial Guinea, Bangladesh, Pakistan, Micronesia, Samoa, Myanmar, Timor-Leste, Kiribati, Tonga, Bhutan and Nauru.

271. Also, in cooperation with the Latin-American Development Bank (CAF), ITU provided support to 8 countries (Bolivia, Dominican Republic, Venezuela, Costa Rica, Panama, Colombia, Paraguay and Jamaica) in the Americas Region and translated the guidelines into Spanish.
272. In addition, 5 other countries in Latin-America were assisted within the BDT Operational Plan.
273. Within the framework of the ITU-Latin-American Development Bank (CAF), a summary report on the digital broadcasting roadmaps, which includes 12 countries, has been prepared.
274. Case studies on the experiences in digital terrestrial television broadcasting transition for Thailand, Japan and Australia have been prepared. Also a report was prepared on the Interactive Multimedia Services and Pay TV in ASP.
275. ITU developed and is maintaining a database for following the transition from analogue to digital terrestrial television broadcasting: <http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx>
276. In its efforts to ensure the widest participation in the enhancement of worldwide communications and that the interests of all stakeholders are taken into consideration, ITU encourages new entities and organizations to join the Union as Sector Members or Associates. In addition, ITU seeks to further develop intellectual cooperation with educational institutions and universities.

Action Line C10: Ethical dimensions of the Information Society



Related to the SDGs: SDG 1, SDG 2, SDG 3, SDG 4, SDG 5, SDG 8, SDG 9, SDG 10, SDG 11, SDG 12, SDG 13, SDG 14, SDG 17



277. UNESCO organised a WSIS Action Line C10 session on “Ethics in AI and converging technologies: Shaping a Human-Centred Future in the Digital Age” on 10 July 2025 at the WSIS+20 High-Level Event 2025. The session highlighted the growing convergence of emerging technologies and the urgent need for ethical frameworks that are interdisciplinary, anticipatory, and localized. For more details on the sessions and the outcomes, please see [here](#).
278. The WSIS Prizes 2025 Winner for the Action Line C10 is: Cyber Security Education Curriculum – 2025, Qatar. Details of the project are available [here](#).+

Action Line C11: International and Regional Cooperation



[Related to the SDGs: SDG 17](#)



279. The Action Line C11 Facilitation Meeting was held on 10 July 2025 together with the Action Lines C1. The title of this session was “Enhanced Cooperation in the Digital Age: From Concept to Commitment at WSIS+20”. For more details on the sessions and the outcomes, please see [here](#).
280. The WSIS Prizes 2025 Winner for the Action Line 11 International and Regional Cooperation is: One Health Data Alliance Africa, Germany. Details of the project are available [here](#).
281. Through continuous international cooperation, the [ITU-R Study Groups](#) develop the technical bases for decisions taken at World Radiocommunication Conferences (WRCs) and develop global standards (Recommendations), Reports and Handbooks on radiocommunication matters. Specialists from administrations, the telecommunications industry as a whole and academic organizations throughout the world participate in the work of the Study Groups on topics such as efficient management and use of the spectrum/orbit resource, radio systems characteristics and performance, spectrum monitoring and emergency radiocommunications for public protection and disaster relief.
282. The ITU-R Study Groups maintain ongoing liaison and collaboration with other organizations in accordance with [Resolution ITU-R 9](#). The Radiocommunication Bureau continues to enable collaborative arrangements and facilitates the conduct official information flows between the Study Groups and other organizations.
283. The ITU-R Study Groups accomplish their work in cooperation with other international organizations and continue to maintain close collaboration with international and regional organizations dealing with the use of spectrum, including the Regional Telecommunication Organizations. Over 5000 specialists from telecommunication and ICT organizations and administrations throughout the world, cooperatively participate in the Radiocommunication Study Groups to prepare technical bases for Radiocommunication Conferences and develop ITU-R outputs. The [recent outputs from the ITU-R Sector](#) are disseminated worldwide and are the result of continuous international cooperation. They form the basis for national and regional spectrum management policies and regulations. The Radiocommunication Bureau (BR) relies on close cooperation with the other Bureaux and Sectors, the ITU regional and area offices and relevant international organisations in carrying out these activities.
284. The [World Radiocommunication Seminars \(WRS\)](#) and [Regional Seminars](#) on spectrum management organized by the Radiocommunication Bureau (BR) continue

to promote international and regional cooperation. These seminars provide direct access to essential information, training, and tools which assist in the standardized application of the Radio Regulations and harmonized use of spectrum. These capacity-building initiatives continue to support ITU Member States and foster international and regional cooperation in radiocommunications.

285. Through international and regional cooperation, each World Radiocommunication Conference plays a pivotal role in expanding equitable access to terrestrial and space-based radio resources, thereby enhancing global connectivity. By collaboratively allocating spectrum in response to emerging technologies, the World Radiocommunication Conferences and contributing studies ensure that all countries, regardless of their level of development, can participate in and benefit from innovations in radiocommunications. The regulatory frameworks adopted at each conference are the result of multilateral collaboration, reflecting a shared commitment to harmonized spectrum use. This cooperative approach safeguards the coexistence of diverse radiocommunication services, fosters regulatory stability essential for long-term investment, and creates an enabling environment for sustained innovation and technological growth.
286. ITU collaborates with other Standards Development Organizations (SDOs), notably the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO), under the World Standards Cooperation (WSC) to promote consensus-based international standards. ITU-T has intensified collaboration on AI standards, with key achievements including the creation of a comprehensive [AI standards exchange database](#) listing over 700 standards and technical publications from ITU, ISO, IEC and IEEE, and the release of two flagship policy and technical papers on standards for deepfake detection as initial outputs of the [AI and Multimedia Authenticity Standards Collaboration](#), a WSC-led initiative, with other partner SDOs. To promote the use of standards as practical tools for trusted AI, ITU is co-organizing the International AI Standards Summit in the Republic of Korea (2–3 December 2025) with the WSC. In addition, ITU-T has strengthened collaboration with IEEE on climate resilience, organized the first IEEE–ITU Symposium on Achieving Climate Resilience (December 2024, Geneva), with a second edition on 16 and 17 December 2025. Several activities are carried out under the Green Standards pillar of the [Green Digital Action at COP30](#) in Brazil. Furthermore, ITU develops technically aligned standards with ETSI on Environmental Efficiency.
287. The WSIS+20 Plan of Action recognized the essential role of satellite systems for connectivity when calling “to develop and strengthen national, regional and international broadband network infrastructure, including delivery by satellite and other systems, to help in providing the capacity to match the needs of countries and their citizens and for the delivery of new ICT-based services”.
288. In parallel with governmental initiatives and also at an unprecedented pace, the satellite industry has produced countless innovations in several areas ranging from: the dramatic increase in throughput delivered by satellite systems: as reflected by the evolution from the rather outdated reference to “high-speed satellite services” in

the 2003 WSIS Plan of Action to the current widespread adoption of the terms “Very High Throughput Satellites”, or the publicly famous use of lower orbits, to the ability to seamlessly integrate with terrestrial systems.

d) WSIS Implementation at the Regional Level

289. In the outcomes of the UN General Assembly overall review on the implementation of the World Summit on the Information Society (WSIS) (GA Resolution A/70/125), regional commissions are invited to coordinate the implementation of the WSIS at the regional level.

290. The WSIS Process at the regional level is coordinated and effectively implemented by the UN Regional Commissions, ITU Regional Offices, Regional Technical Organizations in close collaboration with other UN Agencies and all stakeholders.

291. UN Regional Commissions are working towards Regional WSIS Implementation and Review at the Regional Level. ESCWA is the chair (2025-2026) for the WSIS-UN Regional Commissions.

292. ITU is collaborating closely with UN Regional Commissions and other regional organizations, to enhance regional engagement in the WSIS process by conducting regional WSIS reviews to explore the implementation of WSIS Action Lines to advance the achievement of regional sustainable development goals across different regions. These reviews serve as a platform to assess the implementation of WSIS Action Lines and SDGs at the national and regional levels and provide input towards WSIS review and vision beyond 2025.

293. ITU has contributed to the following meetings, as part of the WSIS+20 review joint preparatory process:

- [Ministerial Conference on Digital Inclusion and Transformation, Astana, Kazakhstan](#) (September 2024), organized by ESCAP, ITU, and CSTD. The summary record is available [here](#).
- [Eighth Asia-Pacific Information Superhighway Steering Committee Meeting, Jeju, Republic of Korea](#) (September 2024), organized by ESCAP
- [Africa WSIS Annual Review: Success, Challenges & Prospects, Dar es Salaam, Tanzania](#) (October 2024), organized by ECA
- [9th Ministerial Conference on the Information Society, Santiago, Chile](#) (November 2024), organized by ECLAC
- [Digital Cooperation and Development Forum \(DCDF\) 2025](#), 23-26 February 2025, in Amman, Jordan, organized by ESCWA.

294. These WSIS+20 regional meetings reaffirmed the crucial role of the WSIS process as a UN multistakeholder coordination mechanism on digital and emerging technologies topics at the regional level. Regional stakeholders have acknowledged ITU's vital role in supporting WSIS implementation and follow-up. In collaboration with UN Regional Commissions and other regional organizations, ITU actively

enhances regional engagement in the WSIS process. Each regional meeting addresses unique challenges and opportunities with a focus on the WSIS+20 review and alignment with the GDC objectives, ensuring meaningful regional contributions to global digital frameworks.

e) United Nations Group on the Information Society (UNGIS)

295. UNGIS was endorsed by the CEB in April 2006 and it serves as an interagency mechanism to coordinate substantive policy issues facing the United Nations system's implementation of the Geneva Plan of Action and Tunis Agenda for the Information Society adopted by the World Summit on the Information Society, thereby contributing to improving policy coherence in the UN system, as requested by the 2005 World Summit.



296. UNCTAD assumed the role of Chair of UNGIS for the 2025–2026 period. The Vice-Chairs for this term are ITU, UNDP, UNESCO, and UN ESCWA, representing the UN Regional Commissions.

297. As permanent secretariat since 2006, and in its rotating Chair and Vice-Chair roles, ITU has kept UNGIS active, results-driven, and highly visible, strengthening system-wide digital cooperation across UN. ITU also maintains the official UNGIS webpage www.ungis.org.

298. Following the adoption of the Global Digital Compact at the Summit of the Future in September 2024, this group has spearheaded the work to support its implementation, starting with the **WSIS Process and 2030 Agenda – GDC Matrix**. With inputs from members of UNGIS and the Geneva Digital Kitchen, this matrix maps the GDC objectives to existing WSIS structures, mechanisms, and activities, offering a structured approach for effective follow-up and implementation. This initiative highlights the key role in bridging emerging priorities with established systems, ensuring coherence and alignment across the UN system.

299. In 2024, UNGIS contributed towards major UN processes and activities, including through inputs and contributions and side events at the High-Level Political Forum, the Summit of the Future (including the GDC consultations) and the Internet Governance Forum (IGF). For more details, please see [here](#).

300. At the IGF 2025 held in Lillestrøm, Norway, ITU, as the UNGIS secretariat, requested and coordinated a UNGIS session titled *Digital Cooperation for Development: UNGIS in Action*. The session brought together a broad range of UN entities to showcase ongoing initiatives supporting digital transformation within the WSIS framework. Presentations covered programs on digital inclusion, AI governance, digital public infrastructure, innovation ecosystems, and regional capacity building. The session was open to all stakeholders. The session also highlighted the resolution titled *Assessment of the progress made in the implementation of and follow-up to the outcomes of the World Summit on the*

Information Society, concluded at the 28th session of the CSTD, and subsequently approved by ECOSOC. Details of the session and its summary are available [here](#).

301. The twenty-second UNGIS meeting was held during the WSIS+20 High-Level Event in July 2025 in Geneva, Switzerland, consisting of a [High-Level meeting](#) on 10 July and a [Working-Level meeting](#) on 11 July. For the 2025–2026 term, UNCTAD is the Chair of UNGIS, while ITU, UNESCO, UNDP, and ESCWA (as the representative from the UN Regional Commissions) serve as vice-chairs. Discussions focused on UNGIS’s input to the WSIS+20 Elements Paper, contributions to the High-Level Political Forum 2025, reflections on the upcoming 20th anniversary of UNGIS in 2026, and strategies to enhance UNGIS’s impact.
302. As part of the WSIS+20 review process discussed during the WSIS+20 High-Level Event 2025, UNGIS submitted a joint input to the WSIS+20 Element Paper prepared by the Co-Facilitators.

f) Measuring the Information Society (Para113-119 of TAIS)

303. In 2022-2024, more than 180 statistical indicators from over 200 economies worldwide were collected through five annual questionnaires. The data were disseminated through the ITU website, [ITU DataHub](#) (an online portal), printed publications such as the [Global Connectivity Report](#), the [Measuring Digital Development: Facts and Figures](#), and electronic download and USB-key of the 27th (July 2023) edition of the [World Telecommunication/ICT Indicators database \(WTID\)](#), available for both Windows and Mac users. Note that the World Telecommunication/ICT Indicators Database was discontinued in 2024. All the data is now available free of charge on [ITU DataHub](#) subject to [updated Terms of Use](#).
304. ITU is an active member of the Partnership on Measuring ICT for Development⁶ and one of the three members of its Steering



⁶ The Partnership on Measuring ICT for Development is an international, multi-stakeholder initiative that was launched in 2004 to improve the availability and quality of ICT data and indicators, particularly in developing countries. The Partnership has guided policy makers in producing ICT statistics that are crucial to informed decision-making, including through the identification of a core list of ICT indicators and methodologies to collect these indicators. The Partnership helps developing countries collect ICT statistics, particularly through capacity-building and hands-on training for national statistical offices, and collects and disseminates information society statistics. Its membership has grown from originally 11, to today 14 regional and international organisations: ITU, UNCTAD, UNDESA, UNESCO Institute for Statistics (UIS), ILO,

Committee, together with UNCTAD and UN DESA. The Partnership has been very active in collecting the data for indicators that can be used to track the progress of the WSIS Targets, has made a concerted effort to highlight the importance of measuring ICT access and use in achieving the SDGs and has taken a lead role in increasing awareness about the importance of international ICT monitoring. The Partnership has developed a core list of ICT indicators as well as associated statistical standards and methodologies, in close consultation with experts from National Statistical Systems. The core list, which has been endorsed by the United Nations Statistical Commission, provides the basis for the production of ICT statistics in countries all over the world.

305. The Partnership is actively engaged in monitoring the Sustainable Development Goals. The 2030 Agenda for Sustainable Development recognizes that “the spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies”. Several SDG targets refer to ICTs and technology, highlighting the need to include specific ICT indicators in the monitoring framework. Nevertheless, in the global SDG indicator framework, which helps to monitor progress, identify challenges, and guide policy makers, out of 231 only 7 ICT indicators are included, covering 6 targets under Goals 4, 5, 9, and 17. Five of the seven indicators are collected and disseminated by the ITU.
306. The Partnership has also developed a thematic list of ICT indicators that could be used to measure ICT availability and use in sectors relevant to the SDGs that are not covered in the global SDG indicators framework. This list was presented during the 2019 WSIS Forum, and finalized after the WSIS Forum 2019, upon receiving feedback from stakeholders. The [list](#) was endorsed by the UN Statistical Commission in its 51st session.
307. During the WSIS+20 High-Level Event 2025, the Partnership organised a session on [“Measuring ICT for development: the importance of data and statistics in the implementation of the WSIS and the Global Digital Compact”](#) that was held on 10 July 2025. This session featured a forward-looking discussion linking the work of the Partnership on Measuring ICT for Development to the implementation of the WSIS action lines and the outcomes of the Summit of the Future. The discussion also considered the context of the WSIS+20 Review.
308. The 15th Meeting of the Expert Group on Telecommunication/ICT Indicators (EGTI) and the 12th Meeting of the Expert Group on ICT Household Indicators (EGH) took place back-to-back in a hybrid format, from 25 to 26 September 2024. More than 200 participants from national statistical offices, ministries, regulators, international and regional organizations, and the private sector attended these meetings. The topics that were discussed during the EGH meeting included a report of the subgroup on reviewing the IDI (jointly with EGTI) and a report of the subgroup on ICT skills. The

UNEP-SBC, UNU-ViE SCYCLE, World Bank, UNECA, UNECLAC, UNESCAP, UNESCWA, EUROSTAT and OECD.

topics covered during the EGTI meeting included a report of the subgroup on reviewing the IDI (jointly with EGH) and a report of the subgroup on ICT prices. The meeting also offered an opportunity to discuss the measurement of quality of service and quality of experience, explore the approaches to measuring the environmental footprint of the ICT sector, and exchange national best practices on collecting ICT/telecommunication market data

309. The 19th World Telecommunication/ICT Indicators Symposium (WTIS-24) was held from 23 to 24 September 2024 in Geneva. It brought together government ministers, business leaders, regulators, national statisticians, academics, data producers, analysts, and partners to discuss the latest trends in digital development and the related data aspects. Under the theme “Metrics to action: Bridging data gaps for universal and meaningful connectivity”, the Symposium highlighted the importance of adequately measuring the enablers of connectivity and showcase promising approaches.
310. The 2023 edition of **Measuring Digital Development: Facts and Figures** is available [here](#). The publication offered a snapshot of the most important ICT indicators, including estimates for the current year. The 2023 estimate of the number of people connected was released on 12 September 2023 and is available [here](#).
311. The *Methodological guide on the use of mobile phone data: Measuring the Information Society (SDG ICT indicators)*, prepared in collaboration with experts from the Task Team on Mobile Phone Data under the UN Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD) was released in November 2022. The Task Team is currently composed of more than 50 members and chaired by ITU. ITU has been active in exploring the use of mobile phone data for information society measurements and has implemented pilots in selected countries and organized sessions in global events including a side event to the 54th Session of the United Nations Statistical Commission and in the 8th International Conference on Big Data and Data Science for Official Statistics held in June 2024 in Bilbao, Spain.
312. As part of the implementation of the UN Secretary-General’s Roadmap for Digital Cooperation, the ITU, the Office of the UN SG’s Envoy on Technology and their partners, have established a set of aspirational targets for 2030 to help prioritize interventions, monitor progress, evaluate policy effectiveness, and galvanize efforts around achieving universal and meaningful connectivity by the end of the decade. Building on this groundwork, ITU and the European Commission (EC) have jointly designed the project “Promoting and measuring universal and meaningful digital connectivity”. The project started in May 2023 and will run until 2026, with a budget of 3 million euros. Through three workstreams -- advocacy, measurement, and research – the project pursues four objectives: increasing awareness of universal and meaningful connectivity (UMC) as a policy imperative; improving the measurement and dissemination of UMC data; enhancing statistical capacity of national actors in measuring UM; and identifying better policies for achieving UMC.

g) Maintaining the WSIS Stocktaking Database (Para 120, Tunis Agenda) and a portal for best practices and success stories (Para 28, Geneva Plan of Action).



313. The WSIS Stocktaking process has been maintained by ITU since 2004 as requested by the WSIS Outcomes (TAIS, Para 120). This **publicly accessible WSIS Stocktaking database** (www.wsis.org/stocktaking), currently with more than 19,000 entries, is a unique global tool for collecting information and regular reporting on information and communication technology related initiatives and projects, carried out by governments, international organizations, the private sector, civil society, academia and other entities, in the context of 11 WSIS Action Lines.
314. In 2015, the UN General Assembly within the framework of the ten-year review of the WSIS (Res. A/70/125) called for a close alignment between the WSIS process and the 2030 Agenda for Sustainable Development (Res. A/70/1). The WSIS Stocktaking process responded by highlighting the contribution of 11 WSIS Action Lines to the achievement of 17 Sustainable Development Goals.
315. The United Nations Economic and Social Council [ECOSOC Resolution 2020/12](#) on "Assessment of the progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society" reiterates the importance of sharing best practices at the global level, and, while recognizing excellence in the implementation of the projects and initiatives that further the WSIS goals, encourages all stakeholders to submit ICT-related projects and initiatives to the WSIS Stocktaking platform.
316. ITU is pleased to invite all stakeholders to update and submit new entries online at www.wsis.org/stocktaking. Submitted activities were reflected in the **WSIS Stocktaking Report 2025**, that was released at the WSIS+20 High-Level Event 2025.

h) Emergency Telecommunications (Para 91 of TAIS)

BDT events

317. In 2022 the United Nations Secretary General António launched the [Early Warnings for All \(EW4A\) Initiative](#), which stipulates that every person in the world should be protected by an early warning system by 2027. ITU is leading the initiative's Pillar 3 on "[Warning Dissemination and Communication](#)" to look at last-mile connectivity and

to ensure that warnings reach the people at risk in time to take action. ITU participated in the Barbados National Consultative Workshop on Early Warning Systems (EW4ALL) convened on 1st and 2nd November 2023 by the United Nations EW4ALL Pillar leaders (UNDRR, WMO, ITU, IFRC) in collaboration with the Department of Emergency Management (DEM) of Barbados. ITU presented the pillar 3 discussions and activities with key stakeholders in the country.

318. ITU participated in the Antigua and Barbuda National Consultative Workshop on Early Warning Systems (EW4ALL) convened on 12th December 2023 by the United Nations EW4ALL Pillar leaders (UNDRR, WMO, ITU, IFRC) in collaboration with the National Office of Disaster Services of Antigua and Barbuda. ITU presented the pillar 3 discussions and activities with key stakeholders in the country.
319. BDT jointly with ETC and GSMA jointly organized a [Caribbean workshop on the role of telecommunications in disaster preparedness, response and recovery](#), that took place from 21 to 23 November 2023 in Bridgetown Barbados. This event presented and discussed how ICT solutions and digital technologies can be used for disaster management and risk reduction in the region. The event also considered the importance and the benefits of emerging technologies for early warning and early action, how simulation exercises can help in increasing resilience to natural hazards and how the mobile industry plays a key role and contributes to build disaster resilience in the region. A SIMEX took place during the second and third day of the event. During this exercise, participants had the opportunity to simulate, through a simulated real experience how to respond to cascading catastrophic events.
320. During COP-28, on December 1, ITU, together with WMO, UNDRR and IFRC, organized a session featuring the potential of AI to accelerate processes and address gaps to achieve the Early Warnings for All initiative. The session – [Early Warnings for All: Artificial Intelligence to unlock the potential of Early Warning Systems](#), presented recent relevant best practices in the application Artificial Intelligence to make early warnings more accessible, efficient, and actionable.
321. During COP-28 commitments and pledges from the mobile and satellite community to support the multi-channel alert dissemination under EW4All were featured in a side event on 4 December 2023: [Digital connectivity and technologies for Early Warning for All initiative](#). This side event was part of the ITU-led Green Digital Action track.
322. On 29 January 2024, a National Workshop was held in Moldova to hand over the Feasibility Study on the deployment and implementation of a Cell Broadcast Service (CBS) solution for sending alert messages. The feasibility study offered technical, economic, and regulatory support to the Moldovan government for implementing an Early Warning System using Cell Broadcast and other alert dissemination methods, such as radio and TV broadcasting. The deliverable also included technical documentation to support the bidding process for the optimal solution.
323. On 26 and 27 February 2024, a hands-on training on the use of ITU's satellite equipment was delivered in Harare, Zimbabwe, to designated staff from the Ministry

of Information and Communication Technology and Courier Services, the Postal and Telecommunications Regulatory Authority of Zimbabwe, POTRAZ and from Zimbabwe's Revenue Authority, ZIMRA. The staff will provide support to the ITU's Area Office by storing the equipment, testing the units before and after deployments, and checking and maintaining the units upon return. ITU HQ team will continue to oversee the overall deployment process of the emergency telecommunication equipment.

324. The Emergency telecommunications team participated in the [Mobile World Congress \(MWC\)](#) , 26-29 Feb 2024 in Barcelona, to promote its work on the *Early Warnings for All* Initiative, highlight its close cooperation with the GSMA and to meet with existing and potential new partners to support ITU in the implementation of this ambitious climate adaptation initiative. For the first time, MWC included a dedicated high level (Ministerial) session on 'Early Warning Systems: The Power of Partnership', which took place at the Ministerial Stage and included the ITU Secretary General, Deputy Head of IFRC, and the Minister of Telecommunications of Columbia.
325. An Inter-agency ICT tabletop simulation exercise training of trainers (ToT) took place in Valencia Spain, from 1 to 3 May 2024. UNICEF, ITU, ETC, and GSMA participated in the ToT where 2 staff from each organization were trained on how to develop ICT table top simulation exercises. This proactive approach has provided the opportunity to these agencies to join hands to design and deliver an interagency SimEx Training of Trainers (ToT), and to jointly support the capacity building of trainers (within/outside their respective agencies) that will be available to support regional, national or local-level emergency telecommunications preparedness SimEx design and delivery. Through this training, each organization would identify and train two of its staff members to be able to organize, design, and conduct simulation exercises in countries that request for this support.
326. ITU participated to the EENA (European Emergency Number Association) conference that took place in Valencia Spain on the 23-26th of April, 2024.
327. The first Rapporteur Group meeting for Study Group 1 took place from 22 April to 3 May 2024. The SQ Question 3/1 on "The use of telecommunications/ICTs for disaster risk reduction and management" was discussed on 26 April 2024. Two workshops took place during the rapporteur meetings, a [Joint Q1/1, 3/1 & 5/1 workshop on transformative satellite connectivity \(23 April 9:30 -17:30\)](#) and a [Q3/1 workshop on resilience in Disasters \(25 April 14:30-17:30\)](#). BDT participated in the joint workshop on Satellite connectivity which discussed how developing countries, particularly unserved or underserved and rural and remote areas, can benefit from these developments. It was broadly discussed that the goal is to support administrations in building their national digital strategies to advance each country's connectivity goals by identifying challenges, potential collaborations to achieve meaningful connectivity with the objective to provide connectivity to all, provide regulatory and business best practices. BDT presented the EW4All initiative and how the satellite sector is key to support its implementation by providing satellite connectivity to

unserved populations so that they can receive early warnings and alerts to take actions to save lives.

328. ITU participated in a virtual Side Event of the G20 DRR Working Group in support of the Brazilian Presidency, focusing on the use of Cell broadcast under the context of Early Warnings for All, on May 8 2024.
329. The UN Early Warnings for All Initiative partners lead the AI Sub-Group of Early Warnings for All, with overall coordination led by ITU. The AI sub-group identifies gaps in countries' early warning systems where AI can add value, then matches them with solutions. Work is ongoing to develop a searchable and interactive AI Solutions Catalogue. The AI sub-group launched the AI for Early Warnings for All Innovation Challenge in 2025 to harness AI in closing critical gaps in early warning systems. A new project proposal was also successfully funded by the Republic of Korea, which will start in January 2026, focusing on 'Advancing Early Warnings through AI: Matchmaking and Pilot Accelerator'.
330. On 8 July 2024, a closed workshop titled "Building Resilient Communities: Leveraging Cell Broadcast in the Western Balkans" was held with designated contact points from Western Balkan countries. The workshop aimed to enhance dialogue and cooperation with relevant authorities and explore the potential for a regional rollout of Cell Broadcast systems for early warning dissemination. This initiative responds to the request for strengthened ITU support in emergency response and seeks to deepen the collective understanding of each targeted country's context, outlining a clear path for implementing support at both national and regional levels.

ITU's support to develop NETPs

331. In 2024 BDT continued to support countries in the development of their [National Emergency Telecommunication Plans](#). Based on the success of the NETP model for the SADC member states, a new NETP model for the English and Portuguese African speaking countries has been developed. This NETP framework will provide support to countries in terms of prioritizing the emergency telecommunications recommendations to be implemented a national level to help increase resilience of countries and will build up the preparedness measures to provide a fast response when disasters strike. Countries included in this model are: Gambia, Nigeria, Ghana, Liberia, Sierra Leone, Kenya, Angola, Equatorial Guinea, Guinea, Sao Tome, Cape Verde.
332. The Workshop on the Implementation of the National Emergency Telecommunications Plan (NETP) in the Union of Comoros, held in Moroni on 15 to 16 April 2024, concentrated on delineating NETP implementation steps and pinpointing challenges specific to Comoros. Its objective was to equip participants with crucial knowledge and tools to enhance national preparedness through robust

NETPs, emphasizing the pivotal role of communications in disaster management. Furthermore, the workshop fostered multi-stakeholder collaboration, provided actionable guidance for NETP implementation, shared best practices to enhance implementation, and facilitated the finalization of a tailored NETP for Comoros.

333. The Workshop on the development of the National Emergency Telecommunications Plan (NETP) for Djibouti, conducted in Djibouti on 5-6 May 2024, aimed to facilitate NETP development through a multi-stakeholder approach, identify stakeholder needs, and draft a customized NETP for Djibouti. Additionally, the workshop established a roadmap for NETP development in Djibouti.
334. Technical support was provided to Georgia through high-level guidance on developing the National Emergency Telecommunication Plan (NETP). The kick-off meeting took place on 18 December 2023, followed by a national workshop on 13 February 2024, where the draft NETP was presented. During the workshop, relevant stakeholders discussed and addressed the steps needed to enhance resiliency.

ITU's Disaster Response

335. As part of the preparedness actions, BDT launched a new initiative in 2023 for pre-positioning ITU satellite equipment. The aim is to reduce response times in the aftermath of disasters so that countries can restore communication links and provide a fast response to affected communities. At the end of 2023, equipment was pre-positioned at: WFP's ETC warehouse in Dubai to assist Arab, ASP as well as African countries; Barbados that will serve as a hub for the Americas and Caribbean region; Zimbabwe, at POTRAZ, where equipment will serve the SADC member states.
336. In July 2024, in order to support the disaster response of hurricane Beryl, the telecommunication development bureau of ITU deployed 7 Iridium satellite phones to Jamaica; 5 Iridium satellite phones to Grenada; and 4 Broadband Global Area Network (BGAN) devices and 4 Iridium satellite phones to St. Vincent and the Grenadines. Hurricane Beryl was recorded to be the earliest Category 5 storm according to the World Meteorological Organization (WMO), and its passage resulted in loss of lives and damage to property and infrastructure, including severe disruptions to communications networks in all of the three islands. In the aftermath of the disaster, the ITU-led Disaster Connectivity Map (DCM) was also activated to support responders with near real-time information on telecommunications connectivity status in Grenada, Jamaica and Saint Vincent and the Grenadines.

Disaster connectivity map

337. The [Disaster Connectivity Map](#) is a joint initiative between ITU and Emergency Telecommunications Cluster (ETC) with input from GSMA. Initiated in 2020, the DCM is a live map that provides information on the type, level, and quality of connectivity available on the ground during times of disasters. In 2024, the DCM was showcased or demonstrated on various events, including: ITU Study Group 12 Mozambique

workshop (27 Feb 2024);EW4All Fiji workshop (28 Feb 2024);ITU Study Group 12 Geneva workshop (23 Apr 2024); ITU AI4Good Summit (31 May 2024); RRS AMS event in Grenada (25 July 2024).

338. In 2024 the DCM was activated in: Mozambique during 3 – 24 Mar 2024 and Madagascar | 26 Mar – 9 Apr. DCM was activated in Grenada and Saint Vincent and the Grenadines to support the connectivity monitoring and response effort of Hurricane Beryl, upon request from ETC, since 30 Jun 2024.

339. ITU, together with Microsoft and UNDRR, is developing an innovative map and visualization tool to assess connectivity levels and disaster risks. Based on different data sources and including the use of Artificial Intelligence (AI), this tool, is designed to help assess levels of subnational connectivity using unique, temporal measurements directly from the [ITU Disaster Connectivity Maps](#) initiative. It allows decision-makers to visualize localized connectivity levels and identify areas at risk, and paves the way for better national assessments and gap analysis for multi-channel communication strategies. First results of this tool are available for Fiji, Tonga, and Vanuatu.

ITU-T work

340. [Technical report on AI for communications: Towards Natural Hazard Management \(ESTR-AICTNHM\)](#) focuses on AI-based communications systems for application before, during, and immediately after a natural disaster. This Technical Report aims to provide an overview of the current state of the art by surveying scientific literature, reviewing the relevant technologies presented at workshops of FG-AI4NDM, and investigating use cases derived from the various topic groups. Technical and social aspects are explored, including the development of AI-based communications systems, the inclusion of stakeholders in the development process, the role of ethical considerations in the development process, and the implementation of such technologies. Accordingly, the benefits and challenges of AI-based relative to traditional technologies with a focus on several communities are discussed.

341. [ITU-T Y.4222](#) “Framework of smart evacuation in a disaster or emergency in smart cities and communities” describes concepts and features of smart evacuation control in disaster and emergency situations. It identifies high-level requirements and ICT infrastructure for smart evacuation along with use cases in disaster and emergency situations.

342. [ITU-T Y.4496](#) “Requirements and reference architecture of smart public health emergency information system” provides the requirements and reference architecture for a smart public health emergency information system that can be implemented to address current and future potential public health risks.

i) International Internet Connectivity (Para27c.ii and 50d of TAIS)

343. ITU-T Study Group 3 continues to study this subject through its current work items via [Question 6/3](#). BDT is providing assistance to East African Community (EAC) and South African Development Community (SADC) countries on the creation of national Internet Exchange Points (IXPs) and achieving efficient and cost effective Regional Internet connectivity.
344. ITU-D Study Group 1 Question 1/1 within its work items for the 2014-2017 study period studied some of the existing resources available, including case studies received, related to the deployment of Internet Exchange Points (IXPs) with an aim to prepare best practice guidelines that may be useful for the Member States. As an example, an empirical study of Kenya and Nigeria assessing the impact of IXPs in these two Sub-Saharan countries has been considered. The Group examined how IXPs can be used to improve connectivity, how they can improve the quality of Internet services provided and potentially save operators money in connectivity fees. Other contributions to the work of the Group looked at the critical cost and performance benefits of IXPs in countries in the Americas (Argentina, Brazil, Colombia and Ecuador), and how they have been able to advance Internet growth in this region.

j) World Telecommunication and Information Society Day

345. World Telecommunication Day has been celebrated annually on 17 May since 1969, marking the date of the founding of ITU and the signing of the first International Telegraph Convention in 1865. It was formally instituted by the Plenipotentiary Conference in Malaga-Torremolinos- in 1973. In recognition of ITU as the lead United Nations agency for ICTs, the World Summit on the Information Society in Tunis, November 2005, called on the General Assembly of the United Nations to proclaim 17 May as World Information Society Day (see paragraph 121 of the [Tunis Agenda](#)).
346. On 27 March 2006, the General Assembly adopted [Resolution 60/252](#), proclaiming 17 May as World Information Society Day to focus global attention on the enormous benefits that the digital revolution in ICTs can bring to the world. That same year, the Plenipotentiary Conference (Antalya, 2006) welcomed the General Assembly's decision and amended [Resolution 68](#) to invite the ITU Council to adopt a specific theme for each World Telecommunication and Information Society Day (WTISD).
347. The [World Telecommunication and Information Society Day 2025](#) took place on 17 May 2025, marking the date of the founding of ITU and the signing of the first International Telegraph Convention in 1865. The theme this year was “Gender equality in digital transformation”. The theme highlights the urgent need to close digital gender gaps in access, affordability, skills, and leadership to ensure that women and girls can fully participate in —and benefit from— the digital future. More details about WTISD are available here: <https://www.itu.int/wtisd>.

k) Bridging the standardization gap (BSG)

348. The BSG Programme is centred around the action plan defined in PP Resolution 123 (Rev. Bucharest, 2023) and Resolution 44 (Rev. Geneva, 2024) on “Bridging the standardization gap between developing and developed countries”. The four areas of focus are: strengthening standards-making capabilities, assisting developing countries on the application of standards, human resources capacity building, and fundraising/partnerships for BSG activities. The objective of the BSG programme is to empower participation and informed dialogue in standards-making from all corners of the world. Empowered participation raises the international acceptance and quality of ITU-T standards and ensures their wide implementation.

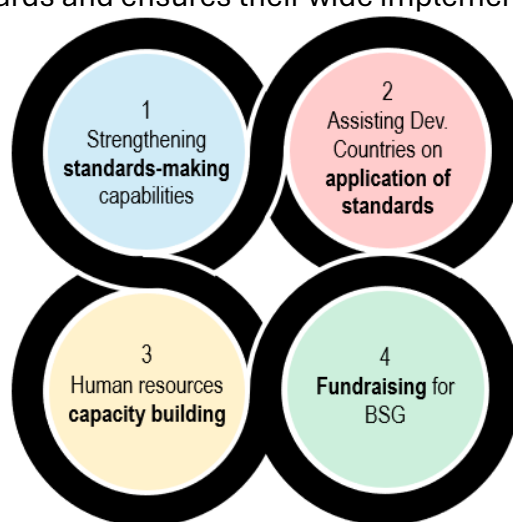


Figure 1: Pillars of the BSG programme

349. BSG engagement is directed towards facilitating participation from developing countries in the standards development process, focusing on the drafting, submission and presentation of effective written contributions, and subsequent engagement in discussions and other standardization activities. This includes fellowships, mentorship programmes, language & electronic working methods support, and tools for remote participation.

350. ITU-T Study Group Mentors are important when it comes to helping newcomers settle in and focus their efforts in line with their objectives. The ITU-T study groups and other groups employ mentoring schemes appropriate for their context, providing both formal support (e.g., newcomer sessions, providing a “meet and greet” and introduction to important study group topics) and informal support (e.g., the mentor and extended management team being available for advice or discussions).

351. Remote participation efforts continue to be enhanced to ensure ease of access from all areas of the world, with minimal bandwidth requirements; and fellowships are provided to support continuity of participation in the work of ITU-T study groups and their regional groups.

352. BSG training covers the development of skills and capabilities for standards-making. This includes interactive BSG workshops (face-to-face and online), online “Contribution Clinics” to help newcomers prepare and submit Contributions on time, and a comprehensive set of [on-demand modules](#) covering:

- Newcomer topics:
 - Getting started, structure and organization of ITU-T.
 - Meetings and documents, including Contributions.
 - Roles and responsibilities.
 - Work item lifecycle, decision-making, electronic working methods.
- Advanced topics:
 - Approval, preparing documents, terms and definitions.
 - Telecommunication Standardization Advisory Group (TSAG).
 - Intellectual Property Rights.
- Leadership team topics:
 - Building consensus.
 - Preparing for and running meetings.

353. The successful hands-on capacity-building training conducted by ITU-T SG3 since early 2014 has been extended to other study groups and their regional groups. These BSG Hands-On sessions are geared towards assisting developing countries in acquiring the right skills and capabilities for international standards-making and to draft contributions for meetings. The sessions focus on the development of practical skills to maximize the effectiveness of developing countries’ participation in the ITU-T standardization process, covering topics including strategies for participation in Study Groups, drafting Contributions, presenting proposals, collaborative working methods and means of gaining support and building consensus. The scope of these capacity building workshops has been extended in 2025, for example, under the joint ITU-T/ITU-D project on AI governance & standards for Asia & Pacific (events held in India, Kuala Lumpur, Bhutan and Cambodia) and a One ITU workshop on “Instruction and knowledge building towards the work of ITU and its bureaux” (Qatar, as part of its preparations to host the Plenipotentiary Conference2026).

354. BSG Community is dedicated to empowerment for standardization, both at the regional and national level. A key example under BSG Community are the regional groups of ITU-T study groups, which ensure that standards-making is inclusive of the needs of all regions.

355. The ITU Radiocommunication Sector (ITU-R) provides a comprehensive range of technical publications and resources that support global spectrum management and radiocommunication services. These accessible resources are essential for bridging the standardization gap and play a critical role in harmonizing international standards and practices. They include ITU-R Recommendations, Reports, Handbooks, and the Radio Regulations. Together, these resources ensure that Member States and stakeholders have access to reliable, up-to-date, and harmonized information essential for effective spectrum management and international coordination.

[The ITU-R Recommendations](#) constitute a set of international technical standards developed by the ITU-R. ITU-R Recommendations are the result of studies undertaken by Radiocommunication Study Groups on:

- the use of a vast range of wireless services, including popular new mobile communication technologies;
- the management of the radio-frequency spectrum and satellite orbits;
- the efficient use of the radio-frequency spectrum by all radiocommunication services ;
- terrestrial and satellite radiocommunication broadcasting;
- radiowave propagation;
- systems and networks for the fixed-satellite service, for the fixed service and the mobile service;
- space operation, Earth exploration-satellite, meteorological-satellite and radio astronomy services.

[ITU-R Reports](#) are a technical, operational or procedural statement, prepared by a Study Group on a given subject related to a current Question or the results of studies.

[ITU-R Handbooks](#) provide a statement of the current knowledge, the present position of studies, or of good operating or technical practice. They provide practical guidance and detailed explanations on specific radiocommunication topics, serving as valuable tools for engineers, regulators, and policymakers.

The Radio Regulations are the binding international treaty governing the use of radio-frequency spectrum and satellite orbits. To support Member States in their application of the Radio Regulations and to bridge the standardization gap, the Radiocommunication Bureau has developed the [Radio Regulations Navigation Tool](#).

I) Internet Governance Forum (IGF)

356. The Internet Governance Forum is a global multistakeholder platform that brings stakeholders together to discuss public policy issues related to the Internet. The **forum** is convened by the United Nations Secretary-General, in line with the mandate set out in paragraph 72 of the Tunis Agenda for the Information Society. The IGF's mandate was renewed in 2015 for 10 years. The Forum's mandate will be subject to a review in 2025.

357. In 2025, the forum held its 20th annual meeting in a hybrid format, hosted by the Government of Norway from 23 to 27 June 2025 in Lillestrøm. Under the overarching

theme Building digital governance together, the meeting featured discussion on some of the most pressing Internet and digital policy issues, from access to the Internet, human rights, to Internet fragmentation, cybersecurity, and Artificial Intelligence and emerging technologies.

358. WSIS sessions at IGF 2025:

- **Open Forum #20: WSIS+20 High-Level Event 2025: OCP Special Briefing**
 - [Session 503— IGF 2025: WSIS+20 High-Level Event 2025: OCP Special Briefing | WSIS+20 High-Level Event 2025](#)
 - <https://www.itu.int/net4/wsis/forum/2025/Agenda/Session/503>
- **Open Forum #83: ITU Call for Inputs on the WSIS+20 Review**
 - [Session 504— IGF 2025: ITU Call for Inputs on the WSIS+20 Review | WSIS+20 High-Level Event 2025](#)
 - <https://www.itu.int/net4/wsis/forum/2025/Agenda/Session/504>
- **Open Forum #18: Digital Cooperation for Development: UNGIS in Action**
 - [Session 505— IGF 2025: Digital Cooperation for Development: UNGIS in Action | WSIS+20 High-Level Event 2025](#)
 - <https://www.itu.int/net4/wsis/forum/2025/Agenda/Session/505>

IV. Overall Review of the Implementation of the Outcomes of the World Summit on the Information Society

359. WSIS is an integral and dynamic process which has evolved over the years to be in keeping with technology changes.
360. In 2005, the Tunis Agenda for the Information Society (paragraph 111) called upon the UNGA to conduct an overall review in 2015 of the implementation of the outcomes of the WSIS. This process, known as the WSIS+10 Review, was convened to assess the progress made in the implementation of the WSIS outcomes and provide the WSIS vision beyond 2015.
361. The UNGA [Resolution 68/302](#) (adopted in July 2014) set out the modalities for the WSIS+10 Review process. It called for a High-Level Meeting to be held in December 2015, preceded by an intergovernmental preparatory process that also takes into account inputs from all relevant stakeholders. In line with this resolution, the President of the General Assembly appointed H.E. Mr Jānis Mažeiks, Permanent Representative of the Republic of Latvia and H.E. Ms Lana Zaki Nusseibeh, Permanent Representative of the United Arab Emirates as co-facilitators for the WSIS+10 Review process. The review led to the adoption of Resolution [A/RES/70/125](#), which reaffirmed the commitment of all stakeholders to the WSIS process, highlighted the WSIS Action Lines as a core framework for digital development, and aligned the WSIS process with the 2030 Agenda for Sustainable Development.
362. WSIS+10 Review (2015): Marking a decade since the original summit phases, this comprehensive 10-year progress review highlighted achievements such as increased global connectivity and enhanced international cooperation. But it also identifying ongoing challenges like the persistent digital divide. Crucially, the WSIS+10 Review produced the new Vision for WSIS Beyond 2015, which stressed the need to align WSIS outcomes with the UN Sustainable Development Goals (SDGs), which were adopted the same year, and ensure ICTs would help advance the 2030 Agenda for Sustainable Development.
363. The General Assembly through its [Resolution 70/125](#) on *Outcome document of the high-level meeting of the General Assembly on the overall review of the implementation of the outcomes of the World Summit on the Information Society* was requested to hold a high-level meeting on the overall review of the implementation of the outcomes of the World Summit on the Information Society in 2025, involving the input and participation of all stakeholders, including in the preparatory process, to take stock of progress on the outcomes of the World Summit and identify both areas of continued focus and challenges.

364. The UNGA [Resolution 79/277](#) (adopted in March 2025) set out the modalities for the WSIS+20 Review process. It called for a high-level meeting to be held on 16 and 17 December 2025.
365. WSIS+20 Review (2025): The forthcoming WSIS+20 Review will assess progress since the Geneva Plan of Action and identify new challenges and opportunities in the evolving information and societies. ITU, together with other UN agencies, is coordinating the preparatory process, collaborating with Member States and key stakeholders to ensure findings and recommendations from the review process feed into global digital governance discussions and remain well-aligned with key development frameworks and global goals.

V. Forums, innovative initiatives and future actions

a) Forums

WSIS+20 High-Level Event 2025 and its outcomes:

366. The WSIS Forum builds upon the outcomes of the UN General Assembly Overall Review of the Implementation of the WSIS Outcomes (UNGA Resolution A/70/125) that recognized the necessity of holding this Forum on an annual basis and called for a close alignment between WSIS and the 2030 Agenda for Sustainable Development. In this context, the WSIS Forum leverages on the WSIS-SDG Matrix and serves as a key forum for discussing the role of ICTs as a means of implementation of SDGs, with due regard to the global mechanism for follow up and review of the implementation of the 2030 Agenda (UNGA Resolution A/70/1). The WSIS Forum is coordinated by ITU and has been co-organized since 2006 by ITU, UNESCO, UNDP and UNCTAD with the engagement of other United Nations Agencies, including FAO, ILO, ITC, UNDESA, UNEP, UNHCR, UNICEF, UNIDO, UNITAR, UNODC, UPU, UN Women, UN Tech Bank for LDCs, UNU, WFP, WHO, WIPO, WMO and UN Regional Commissions.
367. The WSIS+20 High-Level Event 2025 was co-hosted by the ITU and the Swiss Confederation, and co-organized by ITU, UNESCO, UNDP, and UNCTAD. The Event took place from 7 to 11 July in Geneva, Switzerland. Marking two decades since the inception of the World Summit on the Information Society (WSIS), the Event served as a multistakeholder platform for reflecting on the pressing need for global collaboration, digital inclusion, and leveraging technology for development. It also provided an opportunity for multistakeholder dialogue on 20 years of digital progress and for shaping a shared vision for the future. This year's Event reaffirmed the WSIS architecture as the implementation platform for a shared digital future.
368. Together, the Event and the AI for Good Global Summit, which were held at the same time, welcomed over 11,000 participants from 169 countries onsite, with many more joining virtually. The gathering brought together a diverse mix of stakeholders, including 59 ministers and deputies, 56 regulators, more than 60 UN representatives, as well as CEOs, civil society leaders, youth, technical experts, and academics.
369. The Event was chaired by **H.E. Mr. Solly Malatsi**, Minister of Communications and Digital Technologies of South Africa. At the closing ceremony, H.E. Malatsi presented the [Chair's Summary](#), capturing the key messages and outcomes that emerged from the programme of the Event.
370. The Leaders TalkX sessions were moderated by 11 High-Level Track Facilitators and grouped around different themes identified as important by the WSIS Stakeholders during the open consultation process. Please find more details on the High-Level track [here](#).

b) WSIS Action Lines and SDGs Matrix

371. The vital role of ICTs as a catalyst for sustainable development continues to be recognized in the global development agenda, including in the *Transforming Our World: The 2030 Agenda for Sustainable Development*. The Agenda highlights that “the spread of information and communication technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide, and to develop knowledge societies,” alongside advances in science and technology across diverse fields such as medicine and energy.
372. Four targets of the SDGs explicitly recognize the role of ICTs. This applies to the targets on Education and scholarships (4.b) on Gender empowerment (5.b) on Infrastructure for Universal and Affordable access to ICTs and the Internet in the Least Developed Countries (9.c) and more broadly, Goal 17 on Strengthen the means of implementation and revitalizing the global partnership for sustainable development, which calls to enhance the use of enabling technology, in particular ICTs. There are also several references to technology in general throughout the SDGs in which ICTs play an important direct or indirect role.
373. ICTs now empower billions of people worldwide, with applications spanning nearly every sector. These include agriculture, health, education, transportation, trade, finance, climate change mitigation, environmental protection, and disaster risk reduction and management, among many others.
374. Internet, mobile technologies and relevant ICT applications and services unquestionably help strengthen governance; empower people, in particular women and youth; enable wider exercise of human rights including freedom of expression; foster social inclusion of marginalized groups; open up employment opportunities; promote cultural diversity; expand access to learning and scientific knowledge; and create efficiencies in basic services including energy and water, to name here just a few.
375. Despite rapid advancements, digital inequalities persist. Access to ICTs remains uneven between and within countries—particularly between urban and rural areas, and between men and women. The global digital divide remains a pressing challenge, with many still offline, especially in LDCs. Bridging these gaps remains essential for ensuring that no one is left behind in the digital age.

c) WSIS&SDG TalkX

376. The WSIS TalkX is a platform, both virtual and physical, dedicated to sharing experiences and inspirational stories about ICTs for development (implementation of the WSIS Action Lines for Development) by stakeholders all over the world. The WSIS TalkX was initiated during the WSIS Forum 2019 and is continued to be organised in a virtual format since April 2020 at the request of stakeholders. More than 50 sessions (*physical and virtual*) have been conducted, and some sessions have been adapted to podcasts and are available to listen and download at WSIS TalkX Podcast [here](#).

377. In 2022, the WSIS TalkX was rebranded as the WSIS&SDG TalkX with a series of sessions organised to celebrate the UN international days, including UN International Day of Women and Girls in Science, World Radio Day, to name a few. More information of the WSIS & SDG TalkX sessions is available [here](#).
378. All WSIS-organized side events held as part of other UN global processes are also branded as WSIS&SDG TalkX, further reinforcing the platform's role in linking ICTs, the WSIS Action Lines, and the 2030 Agenda across the wider UN system.

d) WSIS Prizes



379. The [WSIS Prizes](#) is a unique global platform that recognizes outstanding initiatives leveraging ICTs for sustainable development. Held annually during the WSIS Forum, the WSIS Prizes celebrate 18 winning projects from a wide range of stakeholders around the world. These projects are recognized for their excellence in implementing the WSIS Action Lines and advancing the UN 2030 Agenda for Sustainable Development.
380. Since its launch in 2012, the WSIS Prizes contest has become a leading mechanism for identifying and showcasing ICT4D success stories. It was developed in response to requests from WSIS stakeholders to establish a transparent, inclusive process for evaluating impactful ICT solutions. The contest is an integral part of the WSIS Stocktaking process set up in 2004 to support WSIS implementation and follow-up.
381. The WSIS Prizes are an integral and important part of the WSIS Stocktaking process and database, which has over 2 million subscribers — promoting best practices and showcasing how digital technologies are driving development and creating tangible impact across all regions and sectors.
382. Following the outcomes of the United Nations General Assembly Overall Review on WSIS (A/RES/70/125), the WSIS Prizes—through the WSIS Stocktaking database—has been collecting information on how submitted projects contribute not only to the WSIS Action Lines but also to relevant Sustainable Development Goals (SDGs),

thereby reinforcing the platform's role in identifying and showcasing success stories aligned with both digital transformation and sustainable development agendas.

383. The [WSIS Prizes 2025](#) contest was launched on 3 October 2024, with a submission deadline of 14 March 2025. A total of 973 ICT-based projects were submitted from around the world. Following an expert review, 360 nominated projects, 20 per Action Line category across 18 categories, were selected for public online voting. The voting phase took place from 11 April to 4 May 2025, gathering wide global participation.

384. During the [WSIS+20 High-Level Event 2025](#), held from 7 to 11 July 2025 in Geneva, ITU recognized the top [90 champion projects](#) for their contributions to the implementation of WSIS Action Lines. Among these, 19 outstanding projects, one per category, were awarded as WSIS Prizes 2025 Winners at the WSIS Prizes 2025 Ceremony on 7 July 2025. These winners represent a diverse range of stakeholders and showcase impactful solutions leveraging ICTs for development and digital inclusion. In addition, the 71 WSIS Prizes 2025 Champions and the 270 WSIS Prizes 2025 Nominees were recognized and celebrated at special ceremonies during the event.

385. Below is the [full list](#) of the 19 winners, in order of the WSIS Action Lines:

WSIS Action Line	Project	Entity	Entity Country — Type
C1: The role of governments and all stakeholders in the promotion of ICTs for development	Situational-Analytical Complex	Engineering and Technical Center of the President's Affairs Administration of the Republic of Kazakhstan	Kazakhstan — Government
C2: Information and communication infrastructure	"Internet para Todos" in Peru	Internet para Todos	Peru — Private Sector
C3: Access to information and knowledge	Digital Awareness Programme	Nigerian Communications Commission (NCC)	Nigeria — Government
C4: Capacity building	National Information Dissemination Centre	Malaysian Communications and Multimedia Commission (MCMC)	Malaysia — Government
C5: Building confidence and security in use of ICTs	AI & Facial Recognition Powered Solution for Telecom SIM Subscriber Verification	Centre for Development of Telematics (C-DOT)	India — Government

C5: Building confidence and security in use of ICTs	Anti-Online Scam Operation Center: AOC	Ministry of Digital Economy and Society (MDES)	Thailand — Government
C6: Enabling environment	Digitech	Dept. of Communications and Digital Technologies	South Africa — Government
C7 ICT Applications: E-government	TAMM AI Assistant: The AI-Powered Government Agent Redefining Public Services	Department of Government Enablement (DGE)	United Arab Emirates — Government
C7 ICT Applications: E-business	From Weeks to Minutes: How Occidental Mindoro Revolutionized Business Permitting	Department of Information and Communications Technology – MIMAROPA Region (DICT – MIMAROPA)	Philippines — Government
C7 ICT Applications: E-learning	Madrasati Learning Management System	Ministry of Education (MoE)	Saudi Arabia — Government
C7 ICT Applications: E-health	A New Era in Zanzibar's Healthcare: The Game-Changing Role of Digital Unique IDs	PharmAccess	United Republic of Tanzania — Government
C7 ICT Applications: E-employment	Graduates Employment Ranking	Ministry of Labour and Social Protection of Population (MLSPP)	Azerbaijan — Government
C7 ICT Applications: E-environment	Rapid, accurate and secure production, dissemination and communication of early warning for meteorological disaster	China Academy of Information and Communications Technology	China — Academia
C7 ICT Applications: E-agriculture	Vegetable Market Information System	Ministry of Agriculture and Forest	Bhutan — Government
C7 ICT Applications: E-science	Improving brain proteostasis as a strategy to reduce the adverse effects of aging on the cognitive decline of the elderly	Biomedical Neuroscience Institute (BNI), University of Chile	Chile — Academia

C8: Cultural diversity and identity, linguistic diversity and local content	Empowering Youth Through Digital Innovation: Enhancing Capacity, Opportunities, and Participation in Civic Life	BASAibu	Indonesia — Civil Society
C9: Media	Girls Speak Out	The Usawa Institute	Zimbabwe — Civil Society
C10: Ethical dimensions of the Information Society	Cyber Security Education Curriculum – 2025	National Cyber Security Agency (NCSA)	Qatar — Government
C11: International and regional cooperation	One Health Data Alliance Africa	Deutsche Gesellschaft für International Zusammenarbeit (GIZ)	Germany — International Organization

386. Detailed descriptions of all WSIS Prizes 2025 winning projects are available [here](#). It is critical to highlight the importance of the multistakeholder and bottom-up approach that is the essential philosophy of the WSIS Forum. Stakeholders highly appreciated the multistakeholder approach of the contest and highlighted the importance of the continuation of this contest to serve as a mechanism to recognize stakeholders for their efforts on the implementation of WSIS outcomes.



e) WSIS Stocktaking Database

387. [WSIS Stocktaking](#) has been maintained by ITU since 2004. It is a unique global platform for collecting information and annual reporting on information and communication technology related initiatives and projects, carried out by governments, international organizations, the business sector, civil society, academia, and other entities. This global repository, currently comprising over 19,000 entries, reflects the implementation of the WSIS Action Lines on the ground.

388. In 2015, the UN General Assembly, during the ten-year review of the WSIS ([Res. A/70/125](#)), called for a strong alignment between the WSIS process and the 2030 Agenda for Sustainable Development ([Res. A/70/1](#)). In response, the WSIS Stocktaking process highlighted the role of 11 WSIS Action Lines in contributing to the achievement of the 17 Sustainable Development Goals (SDGs). [ECOSOC Resolution 2023/3](#) reaffirms the significance of sharing best practices globally and encourages

all stakeholders to submit ICT-related projects and initiatives to the WSIS Stocktaking platform, recognizing outstanding efforts in implementing projects that advance the WSIS goals.

389. WSIS Stocktaking continues to diversify its database with repositories, including the [WSIS Photo Contest](#) (since 2016), [WSIS Healthy Ageing Innovation Prize](#) (since 2021), [WSIS Women in Technology](#) (since 2022), and the recently proposed repositories of [WSIS x Generation Connect Youth Prize](#) (since 2023) and [WSIS Digital Service Design Prize](#) (since 2023). New repositories are in line with the WSIS Forum special tracks on ICTs and Older Persons, Gender Mainstreaming, Youth, and WSIS Action Line e-Government.
390. All WSIS stakeholders are invited to continue submitting updates and new entries online at www.wsis.org/stocktaking.

f) WSIS Forum Photo Contest 2025

391. The 2025 WSIS Forum Photo Contest received a total of 246 submissions. From these, 43 finalists were selected, with 10 winners chosen. The winners represent a diverse range of regions: 1 from an International Organization, 1 from the Arab States, 2 from Europe, 3 from Asia, and 3 from Africa.
392. The finalists are from Kenya, Indonesia, the Philippines, Senegal, Algeria, Thailand, Türkiye, Malaysia, Zimbabwe, Botswana, Eswatini, Bangladesh, and an International Organization. The winning photos can be viewed [here](#).

g) Exhibition

393. The WSIS+20 High-Level Event 2025 gathered many exhibitors from Civil Society, Academia, International Organizations, Private Sector, and Governments. The exhibition allowed a wide array of stakeholders to showcase their projects and the technology behind it. It provided an opportunity to share their initiatives and solutions that harness the power of ICT-enabled development to advance the achievement of the SDGs and expand our Information Society.
394. More than **50 exhibition spaces** showcased innovative digital initiatives from UN agencies, WSIS partners, and regular exhibitors, highlighting digital solutions for sustainable development. The exhibition inauguration set an energetic tone for the week, with interactive photo booths and engaging displays inviting participants to explore and connect around key digital themes.

h) WSIS Special Initiatives

395. ICTs and Gender Mainstreaming:

The WSIS The WSIS Process reaffirms the critical importance of promoting gender equality and the empowerment of women in the digital age. To support this commitment, WSIS established the Gender Trendsetters initiative—highlighting women leaders who are driving digital inclusion, innovation, and empowerment in

their respective fields. These trendsetters actively contribute to WSIS activities, helping to elevate the visibility, participation, and leadership of women in ICTs.

In collaboration with stakeholders, WSIS also launched the WSIS Stocktaking Repository of Women in Technology, designed to identify and connect women ICT leaders and practitioners from all regions and sectors. The repository facilitates their involvement in WSIS Forums, workshops, training programmes, and networking events focused on harnessing ICTs to advance the SDGs.

As part of its ongoing efforts, the annual WSIS Forum includes a dedicated Special Track on ICTs and Gender Mainstreaming. At the WSIS+20 High-Level Event 2025, this was featured under the special track "Women and Girls in Digital", with a series of sessions showcasing strategies, initiatives, and partnerships aimed at bridging the gender digital divide. See the sessions [here](#).

396. ICTs and Older Persons:

The WSIS Forum first introduced the ICTs and Older Persons Track in 2020, highlighting the role of digital technologies in promoting active and healthy ageing. This pioneering effort was recognized in the UN Secretary-General's Report A/75/218, emphasizing the relevance of ICTs in supporting older persons in the labour force and society. In parallel, the WSIS Healthy Ageing Innovation Prize was launched to spotlight impactful ICT solutions improving the lives of older persons. The Prize recognizes innovation across categories such as cognitive health, frailty, mobility, caregiving, and immunization. WSIS also launched WSIS MultiStakeholder Alliance on ICTs and Older Persons, which focuses on four work areas: Design & Accessibility, Capacity Building & Education, Cybersecurity, and Innovation.

397. ICTs and Youth:

Youth inclusion is a central pillar of the WSIS Process, acknowledging the critical role of young people in driving innovation and shaping inclusive digital futures. The WSIS Forum 2025 featured a dedicated Youth Special Track, providing young leaders with a global platform to share ideas, showcase digital solutions, and engage in high-level policy discussions. More than 300 youth participants engaged actively in the Youth special track, contributing through high-level dialogues, knowledge cafés, interactive sessions, and exhibitions. [See all the sessions here](#). There was a strong call for youth to continue being a key component of the WSIS Forum and for the Youth special track to continue.

i) The Global Cyber Security Agenda (GCA)

398. In May 2007, ITU launched the GCA: a framework for international cooperation in cyber security. The GCA has seven main strategic goals and is built around the following five work areas or pillars: (1) Legal Measures; (2) Technical and Procedural Measures; (3) Organizational Structures; (4) Capacity Building; and (5) International Cooperation. It acts on existing national and regional initiatives to avoid duplication of work and encourage collaboration amongst all relevant partners. Within the overall

framework of the cyber security agenda (GCA), ITU along with its partners, are deploying joint services. These services harmonize, at the international level, different national approaches to better prepare countries to face cyber threats and solve cyber-attacks. This is achieved through information sharing, awareness raising and trainings programs. The momentum generated by the GCA and the broad nature of this ITU initiative have resulted in interest from other stakeholders and opportunities for collaboration and cooperation. More on activities under the GCA can be found in the Section on Action Line C5: Building Confidence and Security in the use of ICTs.

399. Second Open Consultation on the draft Guidelines for utilization of the GCA was held during the WSIS Forum 2021 on 1 March 2021.

j) Connect 2030 Agenda for global telecommunication/ICT development

Background

400. At PP-22, ITU Member States adopted revision to Resolution 200 (Rev. Bucharest, 2022): “Connect 2030 Agenda for global telecommunication/information and communication technology, including broadband, for sustainable development”, establishing a set of global targets to be achieved by the whole Union by 2023 in the areas of growth, inclusiveness, sustainability, innovation and partnerships in the telecommunication/ICT sector.

401. Resolution 200 invites ITU Member States to participate actively in the implementation of the [Connect 2030 Agenda](#); to contribute with national, regional, and international initiatives; to provide data and statistics, as appropriate, to monitor progress towards the achievement of the Connect 2030 goals and targets; and to engage all stakeholders through the promotion of partnerships around the Connect 2030 Agenda.

402. At PP-22, ITU Member States also adopted Resolution 71 (Rev. Bucharest, 2022): “Strategic plan for the Union for 2024-2027”, which incorporates the Connect 2030 goals and targets into the framework of ITU’s strategic plan for this period.

Progress for the reporting period measurement, monitoring and reporting

403. An annual report on the progress and implementation of ITU Strategic Plan and the Connect 2030 Agenda is presented each year to ITU Council. The latest report for the period 2019-2020 was presented in June 2021 and is available online (ITU Annual Report 2019-2020).

404. A dedicated microsite for the [Connect 2030 Agenda](#) was also created to track the progress of the Connect 2030 Agenda targets on an annual basis starting from 2020. The microsite provides a dashboard for both the goals and targets, as well as relevant links to publications, data and other resources, so that ITU and its members can progress together towards connecting the world.

405. The Connect 2030 Agenda has 24 targets designed to provide an indication of progress towards the achievement of the 5 goals up to 2023:

Goal 1 – Growth: Enable and foster access to and increased use of telecommunications/ICT in support of the digital economy and society.



Recognizing the role of telecommunications/ICTs as a key enabler for social, economic and environmentally sustainable development, ITU will work to enable and foster access to, and increase the use of, telecommunications/ICTs, foster the development of telecommunications/ICTs in the support of the digital economy and help developing countries make their transition to the digital economy. Growth in the use of telecommunications/ICTs has a positive impact on short- and long-term socio-economic development as well as on the growth of the digital economy towards building an inclusive information society. The Union is committed to working together and collaborating with all stakeholders in the telecommunication/ICT environment in order to achieve this goal.

- Target 1.1: By 2023, 65% of households worldwide with access to the Internet
- Target 1.2: By 2023, 70% of individuals worldwide will be using the Internet
- Target 1.3: By 2023, Internet access should be 25% more affordable (baseline year 2017)
- Target 1.4: By 2023, all countries adopt a digital agenda/strategy
- Target 1.5: By 2023, increase the number of broadband subscriptions by 50%
- Target 1.6: By 2023, 40% of countries to have more than half of broadband subscriptions more than 10 Mbit/s
- Target 1.7: By 2023, 40% of the population should be interacting with government services online

Goal 2 – Inclusiveness: Bridge the digital divide and provide broadband access for all.



Being committed to ensuring that everyone without exception benefits from telecommunications/ICTs, ITU will work to bridge the digital divide for an inclusive information society and enable the provision of broadband access for all, leaving no one offline. Bridging the digital divide focuses on global telecommunication/ICT inclusiveness, fostering telecommunication/ICT access, accessibility, affordability and use in all countries and regions and for all peoples, including women and girls, youth and marginal and vulnerable populations, people from lower socio-economic groups, indigenous peoples, older persons and persons with disabilities.

- Target 2.1: By 2023, in the developing world, 60% of households should have access to the Internet

- Target 2.2: By 2023, in the least developed countries, 30% of households should have access to the Internet
- Target 2.3: By 2023, in the developing world, 60% of individuals will be using the Internet
- Target 2.4: By 2023, in the least developed countries, 30% of individuals will be using the Internet
- Target 2.5: By 2023, the affordability gap between developed and developing countries should be reduced by 25% (baseline year 2017)
- Target 2.6: By 2023, broadband services should cost no more than 3% of average monthly income in developing countries
- Target 2.7: By 2023, 96% of the world population covered by broadband services
- Target 2.8: by 2023, gender equality in Internet usage and mobile phone ownership should be achieved
- Target 2.9: By 2023, enabling environments ensuring accessible telecommunications/ICTs for persons with disabilities should be established in all countries
- Target 2.10: By 2023, improve by 40% the proportion of youth/adults with telecommunication/ICT skills

Goal 3 – Sustainability: Manage emerging risks, challenges and opportunities resulting from the rapid growth of telecommunications/ICT.



To promote the beneficial use of telecommunications/ICTs, ITU recognizes the need to manage emerging risks, challenges and opportunities from the rapid growth of telecommunications/ICTs. The Union focuses on enhancing the quality, reliability, sustainability and resilience of networks and systems as well as building confidence and security in the use of telecommunications/ICTs. Accordingly, the Union will work to make it possible to seize of opportunities presented by telecommunications/ICTs while working towards minimizing the negative impact of undesired collaterals.

- Target 3.1: By 2023, improve cybersecurity preparedness of countries, with key capabilities: presence of strategy, national computer incident/emergency response teams and legislation
- Target 3.2: By 2023, increase the global e-waste recycling rate to 30%
- Target 3.3: By 2023, raise the percentage of countries with an e-waste legislation to 50%
- Target 3.4: By 2023, net telecommunication/ICT-enabled Greenhouse Gas abatement should have increased by 30% compared to the 2015 baseline
- Target 3.5: By 2023, all countries should have a National Emergency Telecommunication Plan as part of their national and local disaster risk reduction strategies

Goal 4 – Innovation: Enable innovation in telecommunications/ICT in support of the digital transformation of society.



The Union recognizes the crucial role of telecommunications/ICTs in the digital transformation of society. The Union seeks to contribute to the development of an environment that is conducive to innovation, where advances in new technologies become a key driver for the implementation of the WSIS Action Lines and the 2030 Agenda for Sustainable Development.

- Target 4.1: By 2023, all countries should have policies/strategies fostering telecommunication/ICT-centric innovation

Goal 5 – Partnership: Strengthen cooperation among the ITU membership and all other stakeholders in support of all ITU strategic goals.



In order to facilitate the achievement of the above strategic goals, the Union recognizes the need to foster engagement and cooperation among governments, the private sector, civil society, intergovernmental and international organizations, and the academic and technical communities. The Union also recognizes the need to contribute to the global partnership to strengthen the role of telecommunication/ICTs as means of implementation of the WSIS Action Lines and the 2030 Agenda for Sustainable Development.

- Target 5.1: By 2023, increased effective partnerships with stakeholders and cooperation with other organization and entities in the telecommunication/ICT environment.

406. Each year, the WTISD theme is also linked to the Connect 2030 Agenda goals and targets, the SDG's and the WSIS Action Lines so as to continue to promote and raise awareness about the possibilities that the use of the Internet and other ICTs can bring to societies and economies, as well as of ways to bridge the digital divide.

Operationalization of the ITU Strategic Plan 2024-2027

407. The ITU secretariat contributed to the progress towards the Connect 2030 Agenda through the implementation of the operational plans of the three Sectors and the General Secretariat.

Contribution of the Connect 2030 Agenda to the Sustainable Development Goals

408. In order for ITU to respond to the needs of its constituents with regards to the 2030 Agenda for Sustainable Development, the secretariat developed the ‘ITU SDG mapping tool’, aiming to provide a comprehensive visual overview of how the ITU strategic framework and Connect 2030 Agenda contribute to the SDGs. The tool visualizes the mapping and the linkage of the ITU strategic framework, Connect 2030 Agenda, WSIS Action Lines and the SDGs and Targets. It is also now linked to the WSIS Stocktaking DB and allows for third parties to publish success stories.



Roadmap for 2030

409. ITU will further advance the implementation of Connect 2030 by:

- *Measurement, monitoring and reporting:* Effective measurement and data analysis is key in meeting the needs of policy-makers and practitioners. Further work required in specific cases to define measurement methodologies will be continued.
- *Coordinated implementation of the ITU strategic and operational plans contributing to the Connect 2030 Agenda:* Ensuring inter-sector coordination on the cross-sectoral thematic areas covered by the Connect 2030 Agenda goals and targets will ensure maximizing the impact of ITU's work.

k) Broadband Commission for Sustainable Development

410. The Broadband Commission for Sustainable Development was established May 2010 by ITU and UNESCO in response to calls by the UN Secretary-General Mr. Ban Ki-moon to step up efforts by the UN to accelerate progress towards the MDGs. The Commission is grounded in the belief that universal connectivity is key to achieve the Sustainable Development Goals (SDGs). Leveraging the strength of its membership

and collective expertise, the Commission's work advocates for meaningful, safe, secure, affordable and sustainable broadband communications services that are reflective of human and children's rights.

411. The Broadband Commission for Sustainable is led by President Paul Kagame of Rwanda and Carlos Slim Helù of Mexico and is co-chaired by ITU's Secretary-General Doreen Bogdan-Martin and UNESCO Director-General Audrey Azoulay. It is comprised of over 40 Commissioners representing a cross-cutting group of top CEOs and industry leaders, senior policymakers and government representatives, and experts from international agencies, academia and organizations concerned with development. Its mission is to catalyze the expansion of broadband connectivity globally to enhance quality of life, power sustainable development, and accelerate the achievement of the of the United Nations' SDGs by 2030.
412. The Broadband Commission believes that high-speed, high-capacity broadband connectivity to the Internet is essential in modern society, with wide economic and social benefits. It aims to promote the adoption of broadband-friendly practices and policies, so the entire world can take advantage of the benefits. It defines strategies for accelerating broadband roll-out worldwide and examines applications that could see broadband networks improve ICT delivery in healthcare, education, environmental management, safety and across society.
413. Every year, the ITU/UNESCO Broadband Commission for Sustainable Development publishes its flagship annual 'State of Broadband' report providing a unique, global snapshot of global progress on reaching universal connectivity. Written through a consensus-driven framework and drawing on the insights of the Commission's high-level, multistakeholder membership, the report provides input on the most pertinent issues facing broadband development; updates on the 2025 Broadband Advocacy Targets; and insights and impact stories from Commissioners. In its 15th anniversary year, the Broadband Commission launched a [new four-part series of reports under the State of Broadband 2025](#). This expanded approach reflects the growing complexity of the broadband and digital ecosystem, offering focused insights into specific areas: progress toward achieving the Commission's seven Advocacy Targets; regional developments with a spotlight on Africa; emerging satellite and non-terrestrial technologies; and the broader transformation of digital societies, including AI, data governance, and digital infrastructure.
414. In Spring 2024 the Broadband Commission for Sustainable Development launched a Working Group on "[Data Governance in the Digital Age](#)", co-chaired by UNESCO, ITU, UNDP and the African Union Commission. This group focuses on creating forward-thinking policy solutions for governing data in the context of a digital and AI revolution. Additionally, it aims to support policymakers and regulators by providing the necessary capacity and tools to effectively navigate the complexities of data governance.
415. The Working Group's toolkit: [Navigating Data in the Digital Age](#) was formally issued on July 8 at the WSIS+20 High-Level Event 2025 in Geneva. This publication reflects a

collaborative effort among experts, policymakers, practitioners, civil society and the private sector committed to advancing human rights-based and equitable approaches to data governance.

416. The Data Governance Toolkit: Navigating Data in the Digital Age offers a practical, rights-based guide to help governments, institutions, and stakeholders make data work for all. The Toolkit is organized around four foundational data governance components—referred to as the 4Ps of Data Governance:

- Why (Purpose): How to define a vision and purpose for data governance in the context of AI, digital transformation, and sustainable development.
- How (Principles): What principles should guide a governance framework to balance innovation, security, and ethical considerations.
- Who (People and Processes): Identifying the stakeholders, institutions, and processes required to build and enforce responsible governance structures.
- What (Practices and Mechanisms): Policies and best practices to manage data across its entire lifecycle while ensuring privacy, interoperability, and regulatory compliance.

417. By issuing these reports, the ITU/UNESCO Broadband Commission for Sustainable Development has developed thought leadership and made worthy contributions to the debate about how best to expand broadband access and services and achieve digital inclusion for all through innovative financing mechanisms. The Commission will continue working with many different stakeholders to fulfil its Universal Connectivity Manifesto dedicated to connecting the unconnected and realizing the forthcoming SDGs and the 2030 Agenda. In addition, in 2023, The Commission contributed to the Global Digital Compact (GDC) calling for the GDC to be anchored in the vision of a connected, inclusive and sustainable world, where no one is left behind from benefitting from digital transformation, where the potential of ICTs is harnessed to realize the 2030 Agenda and to secure a sustainable and inclusive digital future for all. With more than 170 Members of the Commission since 2010, including over 40 current Members, representing all players from the digital ecosystem and a community of more than 500 top External Experts in the field of ICT for development, this multistakeholder leadership platform, has established a solid foundation and strong case to continue its role as a pre-eminent thought-leader on digital .

418. In addition to these reports and its advocacy activities, the Commission maintains an [online inventory](#), housing a wealth of digital resources, country case studies, best practices and regulatory recommendations, in addition to releasing its publicly available [newsletter](#).

419. In addition to its Working Group activities, the Broadband Commission, hosts two face-to-face meetings each year, in some cases virtual, to solicit feedback from regional constituents, including ministers and regulators, as well as members of the private sector and UN high level representatives. At these bi-annual meetings,

Broadband Commissioners debate key issues to advance the work of the Commission, present findings and recommendations from their work throughout the year, offer expertise and guidance to high-profile guests and launch global calls to action like the [2020 Universal Connectivity Manifesto](#).

420. In 2025, the Broadband Commission marks 15 years of high-level advocacy, collaboration, and impact. To commemorate this milestone, the Commission convened a [special anniversary meeting in Geneva on Sunday, 6 July](#) in conjunction with the AI for Good Global Summit and WSIS+20 High-Level Event 2025, that took place in Geneva in the following week (7 – 11 July 2025). This high-level gathering brought together current and former Commissioners, former Co-Vice Chairs, and special guests to reflect on the Commission's contributions to advancing broadband policy and digital development since its founding in 2010.

421. To date, the Commission's key outcomes include:

- 15 annual State of Broadband reports, offering a comprehensive overview of progress and challenges in broadband connectivity, and proposing solutions to close connectivity gaps.
- 35-plus Working Groups conducting research on health, education, gender equality, and other issues, producing actionable recommendations to drive universal connectivity.
- Catalyzing major global initiatives: EQUALS, the Global Partnership for Gender Equality in the Digital Age; Giga, the ITU-UNICEF initiative aiming to connect every school to the Internet by 2030; and the Child Online Safety Universal Declaration.
- Advocating globally by engaging nearly 200 high-level leaders and informing key UN processes and international development agendas.
- Issuing over 100 knowledge products and more than 70 concrete recommendations to guide policies on affordability, infrastructure, skills, and investment.

I) Giga

422. Giga's work continues to advance towards the implementation of WSIS Action Line C2.

423. Giga's global reach has grown, with its footprint reaching 45 countries engaged with Giga by October 2025 and a further 28 countries in the pipeline

424. Giga's work is carried out under four key pillars; mapping schools, modelling the requisite infrastructure, innovative financing approaches and contracting for connectivity, all underpinned by capacity development of all facets of school connectivity.

425. Giga has mapped over 2.2 million countries using government data from over 40 countries, complemented by AI/ML and satellite imagery. Infrastructure mapping

and modelling to foster effective school connectivity has been done for 9 countries, and data collection is underway in 16 other countries.

426. Giga has continued exploring innovative financing approaches to support school connectivity. Representatives from Giga's community have provided useful insights in this respect to the Digital Infrastructure Investment (DIII) working group. One of the outputs of this is the DIII Catalyser, a collaboration platform to unlock digital infrastructure financing, including funding for connecting schools to the internet. In the period, Giga activated its new headquarters in Geneva, the Giga Connectivity Centre, at the vibrant Campus Biotech venue. The Giga Connectivity Centre fulfils a number of important roles: A new knowledge hub, leveraging the vitality of Switzerland's tech community, building on Geneva's expertise in diplomacy and international development to ensure that no child is left behind in the digital age. Host of the Giga Learning Hub, delivering specialized training through the ITU Academy towards effective school connectivity. Focal point for Giga's provision of support to countries in procurement and mobilization of finances for school connectivity.
427. In July 2025, the second Giga Connectivity Forum (Giga's flagship event) took place in the Centre and Campus Biotech, convening decision-makers responsible for school connectivity from Ministries of Education and ICT, Communications Regulatory Authorities, and independent Universal Service Agencies from countries engaged with Giga.
428. From October-December 2025, the Centre will host the Giga Knowledge Spark, a pilot programme bringing together students from Swiss universities with policymakers, experts, and international organisations to co-develop innovative policy solutions to make universal school connectivity viable and sustainable.
429. During 2024-2025, Giga's Barcelona Tech Centre continued to act as a hub for the development of cutting-edge open-source Giga solutions to get schools connected.
- It hosted the GTEP (Government Technology Exchange Programme) in June 2025.
 - From September 2025-March 2026, the Tech Centre will host the Giga Accelerator, a programme which will identify, fund and scale open-source solutions to advance school connectivity.

m)Partner2Connect Coalition

430. Between November 2024 and November 2025, the Partner2Connect Digital Coalition (P2C) strengthened its position as ITU's flagship platform for mobilizing resources, building partnerships, and accelerating impact toward universal meaningful connectivity and sustainable digital transformation. Over this period, the total value of pledges surpassed USD 80 billion, with more than 1,030 commitments from 480 entities across 149 countries. The year was marked by active engagement and

collaboration, beginning with the P2C Annual Meeting in January 2025, which brought together nearly 200 participants from governments, the private sector, civil society, and UN agencies to review progress and set priorities for the year ahead. P2C's matchmaking efforts expanded globally, with Accelerator sessions in the Caribbean (December 2024), Guatemala (May 2025), and Jamaica (October 2025), and an Ecuador Accelerator currently under consideration. These sessions served as dynamic spaces for dialogue and partnership-building, connecting pledgers and policymakers to fast-track the implementation of digital projects aligned with national and regional priorities.

431. P2C's presence at major global events further amplified its impact and visibility. The high-level P2C panel during WSIS+20 in July 2025 showcased transformative pledges and progress toward the USD 100 billion target, followed by a creative, interactive workshop at AI for Good that brought together innovators and policymakers to explore inclusive AI solutions through collaboration. In August 2025, P2C featured prominently at the Connectivity Track of the LLDC3 Conference in Awaza, Turkmenistan, convening a high-level panel that underscored the role of partnerships in closing the digital divide in landlocked developing countries. The Coalition also engaged in Digital@UNGA 2025, where P2C pledgers and partners highlighted the power of digital technologies through affiliate sessions and side events across UNGA week. Complementing these activities, P2C expanded its community engagement through interactive webinars and the growing success of P2C Flash, its online magazine celebrating pledge impact stories and best practices. By November 2025, six editions had been published, with the seventh edition underway, further demonstrating P2C's evolution from a platform for pledging to a global movement driving measurable digital transformation and cooperation.

n) AI for Good Global Summit

Introduction

432. ITU has been at the leading edge of artificial intelligence (AI) since 2017 with the aim of identifying practical AI applications to solve global challenges and contributing to universal connectivity and sustainable digital transformation.
433. ITU is executing an ambitious programme on AI, guided by Resolution 214 (Bucharest, 2022) of the Plenipotentiary Conference, and amplified by Resolutions A/RES/78/265 and A/RES/78/311 of the UN General Assembly. These AI resolutions underscore the necessity of developing secure and trustworthy AI systems that contribute to inclusive, sustainable development, and enhance international cooperation on capacity building in this regard.
434. At the heart of ITU's efforts is the **AI for Good** platform led by ITU and supported by over 50 UN partners, which aims at unlocking AI's potential to serve humanity through identifying innovative AI applications, building skills and standards, and advancing partnerships to solve global challenges.

435. As demand for AI activities grows significantly, ITU is adapting its programmes to meet global needs. Through ITU's AI for Good initiatives, including the Neural Network smart-matching platform with over 43 000 members from over 180 countries, the AI for Good Infinity Framework, and the AI Scholar Programme, AI start-up and robotics competitions, machine learning challenges, and the ITU Journal, a repository of AI knowledge and applications is being amassed. The AI for Good Impact Initiative plays a crucial role in mobilizing the necessary resources to broaden AI applications globally, ensuring equitable progress in solving global challenges across all regions. This foundation is ITU's collective intention to drive meaningful change through the implementation of ITU Resolution 214 (Bucharest, 2022) and build a network of supporters to help fund and resource our AI for Good activities globally.
436. The 2025 AI Governance Dialogue took place on 10 July 2025 as part of the 2025 AI for Good Global Summit. Global dialogues on AI governance driven by AI for Good Global Summits ensure that developing countries are included in discussions that can shape the digital future. At this year's AI Governance Dialogue organized by ITU with over 50 UN partners, ministers and high-level government officials joined stakeholders from around the world to chart pathways for responsible and impactful AI. The dialogue was co-chaired by Majed Al Mesmar, Director-General of the Telecommunications and Digital Government Regulatory Authority of the United Arab Emirates, and Anne Bouverot, France's Special Envoy for Artificial Intelligence. The vision captured by the co-chairs' summary report calls for AI that bridges innovation, inclusion, and sustainability.
437. The UN General Assembly 2025 adopted the **resolution on AI modalities** with the decision to convene the first Global Dialogue on AI Governance, on the margins of the AI for Good Global Summit 2026 in Geneva. The event will therefore gather, at the highest level, government representatives, UN representatives, industry leaders, AI innovators, researchers and scientists.
438. With AI innovation growing in speed and scale, the AI for Good Global Summit reinforced the global commitment to AI governance, skills, and standards. Over 11 000 participants from 169 countries participated in the 2025 AI for Good Global Summit and World Summit on the Information Society (WSIS)+20 High-Level Event, with many more taking part online.
439. The AI for Good platform has become a powerful tool for fostering public-private partnerships, facilitating knowledge exchange, and assisting developing countries in achieving sustainable development through the practical application of high-potential AI use cases. Next year's AI for Good Global Summit will take place in Geneva from 7 to 10 July 2026.

o) Girls in ICT Day

440. In 2025, International Girls in ICT Day was celebrated on 24 April. This year, the global celebration was co-hosted by the Commonwealth of Independent States (CIS) and the Arab States regions as a hybrid event, which featured a live link between Bishkek, Kyrgyzstan, and Nouakchott, Mauritania, along with distinguished panellists from around the world, live-streamed for a global audience. This year's theme for the Girls in ICT day celebrations is "Girls in ICT for inclusive digital transformation". More information is available at: <https://www.itu.int/women-and-girls/girls-in-ict/>.
441. ITU Europe Office continued its year-round efforts to promote Girls in ICT throughout 2024 with a focus on "Leadership," highlighting the need for strong female role models in STEM careers. The event engaged a diverse range of stakeholders, including representatives from European Ministries, NGOs, UN organizations, the private sector, and young women across Europe. The event featured open dialogues and personal stories from young people, emphasizing the role of young women in digital transformation and the challenges they face. More information can be found [here](#).

p) Equals in Tech Awards

442. For the past 11 years, the EQUALS in Tech Awards have been recognizing outstanding projects and initiatives around the world that are working towards bridging the gender digital divide. They have been highlighting impactful work that is bettering the lives of girls and women everywhere. Prizes are awarded for outstanding achievement and innovative strategies in five categories: Access, Skills, Leadership in Technology, Leadership in SME (small and medium enterprises) and Research.
443. The 2023 EQUALS in Tech Award winners were announced at the ceremony on 12 December 2023, during Partner2Connect Annual Meeting at ITU headquarters in Geneva, Switzerland. More information is available at: <https://www.equalsintech.org/>.
444. The 2024 EQUALS in Tech Award winners received almost 400 nomination for +100 countries and winners of each category will be announced at the ceremony back to back Partner2Connect Annual Meeting at ITU headquarters in Geneva, Switzerland in 2025. More information is available at: <https://www.equalsintech.org/>.

q) Roadmaps for WSIS Action Lines C2, C4, C5, C6

445. In line with its mandate and the WSIS outcome documents, the ITU continues to play a key role in the WSIS implementation and follow-up process, in particular, as the WSIS Action Lines Sole Facilitator for AL C2 (Information and Communication Infrastructure), AL C5 (Building Confidence and Security in the Use of ICTs), and AL C6 (Enabling Environment). ITU has also been performing the role of the lead WSIS Action Line facilitator and implementer of WSIS Action Line C4 (Capacity Building).

446. With the aim of strengthening the implementation mechanism, ITU Council 2009 agreed on the framework for roadmaps of ITU's activities in its role as the sole facilitator for the above mentioned WSIS Action Lines in the implementation of WSIS up to 2015. Highlighting the important role of ITU in implementing the WSIS Action Lines until 2025, revised resolution 140 in para 8 under resolves instructs ITU to do the following with regard to the roadmap:

- updating its roadmaps for WSIS Action Lines C2, C4, C5 and C6 to take into account activities under way to also implement the 2030 Agenda for Sustainable Development;
- providing input, as appropriate, into the roadmaps/work plans for WSIS Action Lines C1, C3, C7, C8, C9 and C11, also related to the 2030 Agenda for Sustainable Development

447. Roadmaps are detailed plans to guide progress towards achieving WSIS goals, also related to the 2030 Agenda for Sustainable Development. They provide broad vision and detailed overview of the activities planned within the mandate of the Union. Direct links between the activities and the strategic goals and relevant resolutions, programmes and initiatives of the ITU are highlighted. The roadmaps include timeframes, expected results, impact on ITU's human and financial resources as well as list of relevant partners.

448. At its 38th ITU Council Working Group (CWG) on WSIS&SDG in January 2022, the Secretariat was requested to prepare the ITU Roadmaps in accordance with the template approved during the 36th CWG-WSIS&SDG meeting in January 2021, and in alignment with the Strategic Plan of the Union for 2024-2027, including the outcomes of WTSA-20 and WTDC-21.

449. The Roadmaps can be accessed at <https://www.itu.int/en/itu-wsis/Pages/default.aspx>.

r) Communication and Outreach

450. WSIS Flash: is a monthly newsletter on WSIS Related news, projects and activities. <https://www.itu.int/net4/wsis/stocktaking/Flash/Newsletter>

451. ImeetyouatWSIS provides all registered onsite participants of the WSIS Forum with an online social networking community experience, now featured on WSIS Process LinkedIn group. This component of the WSIS Forum has been specially designed for the WSIS Forum onsite and remote participants.

452. WSIS Process on Facebook: The WSIS Facebook page gives opportunity for stakeholders to get informed and actively contribute to the page: <https://www.facebook.com/WSISprocess>

453. @WSISprocess on X: The WSIS X page gives opportunity for stakeholders to get informed and actively participate at the page: <https://x.com/wsisprocess>

454. WSIS Process on YouTube: WSIS Forum highlights, interviews and all the important WSIS Related Videos are available on the WSIS Forum You Tube site: <https://www.youtube.com/wsisprocess>
455. WSIS Process on LinkedIn: WSIS Process has a LinkedIn group: https://www.linkedin.com/groups/WSIS-Process-World-Summit-on-2599279?gid=2599279&trk=hb_side_g.
456. WSIS in ITU News: The ITU News is a media partner of the WSIS Process and regularly publishes WSIS Process related articles in several issues: <https://www.itu.int/en/itu-news/Pages/default.aspx>
457. WSIS is also on Instagram: the WSIS Process Instagram account allows to share pictures and videos and give the opportunity for the followers to comment and share them https://www.instagram.com/wsis_process/

s) WSIS Fund in Trust

458. The WSIS Trust Fund was established in 2011 with the adoption of Plenipotentiary Conference [Resolution 140](#). Council [Resolution 1332](#) as modified by ITU Council in May 2016 takes into account the outcomes of the United Nations General Assembly Overall Review of the Implementation of WSIS Outcomes and the 2030 Agenda for Sustainable Development, and resolves to maintain the fund to support ITU activities to facilitate the implementation of WSIS outcomes, calls for partnerships and strategic alliances, and invites the ITU Membership to make voluntary contributions to the fund.
459. Since its creation, information on the WSIS Trust Fund and stakeholder contributions has been reflected at the dedicated website: <https://www.itu.int/en/itu-wsis/Pages/WSIS-Fund-in-Trust.aspx>. This provides an opportunity to thank all those who have contributed towards the Trust Fund to date for their dedication and commitment towards WSIS Implementation, in particular the WSIS Forum. Moving towards 2025, and following the multistakeholder approach, the WSIS Forum will build upon the outcomes of the WSIS+10 Review and the 2030 Agenda for Sustainable Development.
460. The ITU would like to thank all WSIS stakeholders who have generously contributed to the WSIS Fund in Trust, the names of all contributors are reflected in the dedicated site of the WSIS Fund in Trust <http://www.itu.int/en/itu-wsis/Pages/WSIS-Fund-in-Trust.aspx>
461. The success of the WSIS+20 High-Level Event 2025 was made possible through the commitment and generous support of various partners:
- WSIS Long-Standing Partner: United Arab Emirates
 - Platinum Partner: Malaysia
 - Gold Partners: Saudi Arabia, South Africa
 - Silver Partner: Japan

- Contributing Partners: CAICT, EY, ICANN, IEEE, ISOC, TakingITGlobal
- Supporting Partners: Rwanda, United Kingdom, Wallonia-Brussels in Geneva, Afnic, IFIP, ICNM-World Summit Awards.

t) Future Actions

462. The United Nations General Assembly, through resolution A/RES/79/277, decided to convene a high-level meeting on the WSIS+20 Review at the highest possible level on 16 and 17 December 2025, in accordance with the rules of procedure of the General Assembly. This meeting will mark a significant milestone in assessing the progress made in the implementation of WSIS outcomes over the past two decades and will help shape the digital development agenda beyond 2025.
463. As preparations for this high-level meeting are underway, WSIS stakeholders—including governments, private sector entities, civil society organizations, international and regional organizations, technical communities, and academia—are strongly encouraged to actively participate in the ongoing WSIS+20 Review process. Their engagement is essential to ensure the review is inclusive, forward-looking, and reflective of the evolving needs and challenges of the global digital landscape.
464. Stakeholders are invited to contribute through national, regional, and global consultations, as well as by engaging in relevant events such as the WSIS Forum, submitting written inputs, sharing good practices, and participating in multistakeholder dialogues. These inputs will help inform discussions leading up to the high-level meeting and ensure that the WSIS Process remains anchored in a multistakeholder approach.
465. Looking ahead, the WSIS Process will continue to serve as a global platform for dialogue and cooperation on digital development. Stakeholders are encouraged to remain actively engaged, helping to build a people-centered, inclusive, and development-oriented information society that supports the achievement of the 2030 Agenda for Sustainable Development and addresses new and emerging digital priorities beyond 2025.

VI. WSIS+20: Review and WSIS Beyond 2025

466. In 2015, the UN General Assembly Overall Review resolved to hold the WSIS Forum on the annual basis till 2025. WSIS+20 will provide opportunity to reflect and discuss on the evolution of the WSIS implementation process.
467. [Resolution 70/125](#) requests the General Assembly to hold a high-level meeting on the overall review of the implementation of the outcomes of the World Summit on the Information Society in 2025 (referred as “WSIS+20”), involving the input and participation of all stakeholders, including in the preparatory process, to take stock of progress on the outcomes of the World Summit and identify both areas of continued focus and challenges. It also recommends that the outcome of the high-level meeting be considered as an input into the review process for the 2030 Agenda for Sustainable Development, including outcomes of the SDG Summit in 2023 and inputs to the next SDG Summit in 2027.
468. WSIS+20 roadmaps:
- [World Summit on the Information Society \(WSIS\)+20: WSIS Beyond 2025: WSIS+20 Roadmap](#); elaborates the ITU Secretary-General’s roadmap on the role of ITU in the WSIS+20 Review process and its preparations. It outlines ITU’s leadership in engaging stakeholders, assessing progress, and aligning WSIS Action Lines with the 2030 Agenda for Sustainable Development. The roadmap emphasizes comprehensive preparations, including detailing activities, events, and reporting mechanisms, all aimed at informing the UN General Assembly Overall Review in 2025. Through collaborative efforts, it identifies priorities for advancing digital development beyond 2025 while fostering global partnerships and dialogue.
 - [Report by the Director General on implementation of the World Summit on the Information Society \(WSIS\) outcomes](#), elaborates UNESCO’s roadmap towards the WSIS+20 review.
 - [CSTD Roadmap for the WSIS+20 Review United Nations Conference on Trade and Development](#).
469. At the WSIS+20 Forum High-Level Event 2024, several multistakeholder dialogues and discussions were held to discuss the preliminary steps towards the WSIS+20 review process. The sessions were included as part of the [Digital Governance Processes: WSIS, GDC/ Summit of the Future Special Track](#). These sessions concluded with key takeaways emphasizing the need to avoid duplication of efforts while acknowledging existing mechanisms and recognizing the substantial work that lies ahead. Stakeholders reaffirmed the value of the multistakeholder framework and highlighted the key elements of the WSIS process, such as the WSIS Forum, the Internet Governance Forum (IGF), the United Nations Group on the Information Society (UNGIS), the WSIS Stocktaking platform, etc.
470. At the WSIS Forum 2025, branded as the WSIS+20 High-Level Event 2025, all discussions related to the WSIS+20 review were organized under a dedicated

WSIS+20 special track. The WSIS+20 Co-Facilitators, H.E. Mr. Ekitela Lokaale, Permanent Representative of Kenya to the United Nations, and H.E. Ms. Suela Janina, Permanent Representative of Albania to the United Nations, were present and actively engaged with participants. Consultations with the Co-Facilitators took place ahead of the WSIS+20 Overall Review by the UN General Assembly in December 2025, including:

- **WSIS+20 Overall Review multistakeholder consultation with co-facilitators**, 9 July 2025, 16:45-17:45 (UTC+02:00). The stakeholder consultation session brought together participants from various sectors and regions. The multistakeholder approach remains a cornerstone of the WSIS+20 process, supported by transparent, coordinated, and adaptable engagement mechanisms. Participants highlighted the critical need to avoid duplication while continuing to advance digital inclusion and address emerging technologies. The WSIS Action Lines have stood the test of time and continue to remain agile in meeting new challenges. Stakeholders are encouraged to actively engage and contribute to the ongoing consultations for the WSIS+20 Overall Review.
- **Charting the Path Forward for the WSIS+20 Review: A conversation with the WSIS+20 Co-Facilitators**, 11 July 2025, 15:00-15:30 (UTC+02:00). The session, co-moderated by Mr. Thomas Schneider, Ambassador and Director of International Affairs at Switzerland's OFCOM, and Ms. Cynthia Lesufi, Minister Counsellor and Chair of the ITU Council Working Group on WSIS & SDGs, opened with an interactive dialogue featuring H.E. Mr. Ekitela Lokaale (Kenya) and H.E. Ms. Suela Janina (Albania), the Co-Facilitators of the WSIS+20 review. Mr. Lokaale emphasized the WSIS community's strong multi-stakeholder engagement, shared the roadmap including the June 20 Elements Paper, extended the submission deadline to July 25, and outlined plans for informal consultations followed by formal negotiations toward a December 16–17 outcome. Ms. Janina praised WSIS as a vital platform for inclusive collaboration while stressing the need to revisit its foundational goals to tackle ongoing challenges like the digital divide and equitable ICT-driven development, concluding with a call to “walk this talk together.” The co-moderators expressed thanks to the CoFacilitators and participants, reaffirming that the WSIS Forum remains a central space for nurturing multistakeholder momentum around WSIS Action Lines. Thus, the session reinforced WSIS+20's role as a reflective and forward-looking mechanism to build on past successes, while charting a collective, inclusive path for the future.

Summaries of these sessions are also available on the respective session pages. The interview with the WSIS+20 Co-Facilitator is also available [online](#).

471. **WSIS+20 Joint preparatory process:**

Towards the WSIS+20 review, efforts have been made to establish a unified WSIS+20 review process involving all UN agencies, including ITU, UNESCO, UNDP, UNCTAD, UN DESA, and UN CSTD. Regular meetings are organised to facilitate collaborative

to the United Nations, as co-facilitators to lead the overall review of the implementation of the outcomes of the World Summit on Information Society.

On 21 May 2025, the WSIS+20 Co-Facilitators presented a roadmap of key steps leading up to the draft outcome document of the overall review of the implementation of the outcomes of the World Summit on Information Society.

The updated indicative roadmap is outlined below:

Date	Meeting / Milestone	Venue / Details
25 March 2025	Adoption of Modalities Resolution A/RES/79/277	
30 May 2025	1st Preparatory Meeting & Stocktaking Session	Conference Room 1, UNHQ
9-10 June 2025	Consultations with Stakeholders	Virtual: • 9 June, 8-11pm EST • 10 June, 10am-1pm EST
20 June 2025	Elements Paper	Written inputs to the Elements Paper
June/July 2025	Consultations with Stakeholders and Member States	Various locations • UNESCO, 4-5 June 2025 • IGF, 23-27 June 2025 • WSIS Forum, 7-11 July 2025 • Follow-up Informal Stakeholder Consultation Session, 29 July 2025
29 August 2025	Zero Draft	Written inputs to the Zero Draft Written inputs in the form of text proposals should be sent by email (ungawsisreview@un.org) to the Secretariat in MS Word format no later than 26 September 3 October. All submissions will be made available online.
16 September 2025	PGA reappointment of WSIS+20 Co-Facilitators, H.E. Mr. Ekitela Lokaale and H.E. Ms. Suela Janina	Official Letter from the President of the General Assembly, H.E. Ms. Annalena Baerbock

13-14 October 2025	Consultations with Stakeholders and Member States	Virtual: 13 October, 10:15pm EST 14 October, 10am EST
15 October 2025	2nd Preparatory Meeting	ECOSOC Chamber, UNHQ 10:00-13:00, The session can be followed live via: https://webtv.un.org/en/asset/k15/k15nex2epl
16-17-20 October 2025	Informal Negotiations	UNHQ
27-28 October 2025	Consultations with Stakeholders and Member States	In person and virtual, at the ICANN84 Annual General Meeting in Dublin, Ireland
31 October 2025	Side Event Application Deadline	Application form for: in-person side event at UNHQ in-person side event outside UNHQ fully virtual side event
7 November 2025	Review of all Side Event Applications	Room assignments and timeslot allocation for UNHQ events will be announced shortly after the selection. The final programme will be published mid-November 2025.
November 2025	Draft Outcome Document	
14 November 2025	Consultations with Stakeholders and Member States	Virtual (via Zoom), 8 a.m. EST Registration deadline is 7 November. Click here to register
20-21 November 2025	Informal Negotiations	UNHQ 20 November 10:00-13:00, CR. 12 15:00-18:00, TRI 21 November, ECOSOC

15 & 16-17 December 2025	High-Level meeting of the General Assembly on 16 and 17 December with official side events starting on 15 December	UNHQ with some official side events taking place off-site and virtually.
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The Co-Facilitators of the WSIS+20 review process have issued the Elements Paper, which summarizes key themes, priorities, and proposals emerging from preparatory discussions and stakeholder consultations to date. This paper aims to guide ongoing dialogue with Member States and stakeholders in the lead-up to the review.

All stakeholders were invited to submit written inputs by 25 July 2025 via the submission form. The Elements Paper can be accessed [here](#).

ITU contributed to the Elements Paper, both through its own input and via the UNGIS submission, which also served as a separate contribution from UNGIS.

The Co-Facilitators of the WSIS+20 process have released the [Zero Draft](#) of the outcome document for the twenty-year review of the implementation of the World Summit on the Information Society. The draft reflects inputs from Member States and stakeholders, as well as contributions from across the UN system.

In line with the Preparatory Process Roadmap, Member States and stakeholders have the opportunity to provide written inputs on the [Zero Draft](#) by 26 September, with the deadline extended to 3 October 2025. The Co-Facilitators request that such submissions be sent by email (ungawsisreview@un.org) to the Secretariat in MS Word format, to facilitate consolidation of inputs, no later than the deadline.

The ITU has submitted its written inputs in response to this call, and all written contributions are available [online](#).

The ITU remains actively engaged in the WSIS+20 Review Preparatory Process, including through its contributions to the ongoing consultations.

474. 80th session of the UN General Assembly:

As outlined in the WSIS+20 review modalities resolution, the high-level meeting of the General Assembly on the WSIS+20 review will be convened at the highest possible level on 16 and 17 December 2025, in accordance with the rules of procedure of the General Assembly.

On the sidelines of the 80th session of the UN General Assembly, ITU organized the following sessions:

1. WSIS+20: Shaping the Future Beyond 2025” held on 16 September 2025, from 10:00 AM-12:00 PM (New York time). The session was co-organised by ITU and UNDP, with the support of Member States and other stakeholders. Details of the event are available [here](#).
2. A briefing session co-organized by ITU and European Union (EU) for the EU members on WSIS+20. It was held on 17 September 2025 at 09:00 AM (New York time). The session provided an update on key milestones in the WSIS+20 joint preparatory process and included a discussion on the Zero Draft, focusing on its main elements and incorporating feedback from the European Union.

475. WSIS+20 Action Lines milestones, challenges and emerging trends beyond 2025:

The WSIS Action Lines serve as a key framework for advancing progress towards the achievement of the SDGs. The WSIS Action Lines cover eleven areas of focus with technology serving as a key enabler for sustainable development. The WSIS-SDG Matrix, developed by the UN Action Line Facilitators, clearly shows the linkage between each Action Line and the 17 SDGs and provides the rationale for each.

The ITU, together with other WSIS Action Line facilitators from other UN agencies, has prepared presentations highlighting key milestones, challenges, and emerging trends beyond 2025. The presentations are available [here](#).

476. ITU’s call for inputs on the WSIS+20 Review:

In accordance with ITU Council Resolution 1332, ITU launched a [call for inputs on WSIS+20 review](#). Members and other stakeholders were invited by the Chair of the CWG-WSIS&SDG to contribute their views on the work of the ITU in the WSIS+20 review, including ideas related to the review of the WSIS Action Lines.

Out of 97 submissions received, some of which included input from various entities, including governments within regional groups, 62 were published upon consent: [CWG-WSIS&SDG Call for Inputs on the WSIS+20 Review Responses](#). The summary of submissions was presented to the ITU Council 2025 (Document [C25/53](#)). It was agreed during Council that the Chair of CWG-WSIS&SDGs would transmit document C25/53 together with all the individual submissions to the UNGA overall review.

477. Alignment with other UN digital governance processes:

On 22 September 2024, Member States adopted the Pact for the Future, which includes the Global Digital Compact (GDC). In paragraph 71, the GDC requests the UN Secretary-General to provide a Compact implementation map for consideration by Governments and other stakeholders. This [GDC Implementation Map](#) has been developed by the Working Group on Digital Technologies (WGDT) under the leadership of the ITU and as per paragraph 71, reflects the contributions of the United Nations system and other relevant stakeholders and will be included in the UN Secretary-General's report on the progress made in implementing and following up on the outcomes of the World Summit on the Information Society, at both regional and international levels, ahead of the WSIS+20 review. The GDC and the WSIS+20 review are closely aligned in their shared objective of

advancing global digital cooperation and addressing the evolving challenges of the digital age.

At its 28th annual session, the Commission on Science and Technology for Development (CSTD) finalized the ECOSOC resolution titled “Assessment of the progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society” (Report [E/2025/31–E/CN.16/2025/4](#)). The resolution was approved by the ECOSOC 2025 Management Segment on 29 July 2025. It emphasizes the importance of integrating the implementation of the GDC commitments into the WSIS architecture.

Recognizing the importance of integrating the implementation of the Global Digital Compact commitments into the World Summit architecture in order to avoid duplications and ensure a cohesive and consistent approach to digital cooperation,

129. Looks forward to continuing consultations and engagements towards the implementation of the Global Digital Compact, building on the World Summit on Information Society architecture, including the World Summit 20-year review, and underlines the importance of ensuring synergies and avoiding duplication within the United Nations system and across various entities, building on established mechanisms and maximizing global digital cooperation;

131. Recommends that, as an outcome of the World Summit 20-year review, the Global Digital Compact commitments be integrated, as appropriate, by the corresponding facilitators into the work of the World Summit action lines;

133. Recommends further that, as an outcome of the World Summit 20-year review, the United Nations Group on the Information Society be tasked with developing a joint implementation road map, to be presented to the Commission on Science and Technology for Development at its twenty-ninth session, to integrate the Global Digital Compact commitments into the World Summit architecture, ensuring a unified approach to digital cooperation that avoids duplication and maximizes resource efficiency.

The Zero Draft of the WSIS+20 Outcome Document also acknowledges the integration of the Global Digital Compact commitments into the WSIS architecture. Paragraph 142 states:

“142. We note with appreciation the matrix prepared by the United Nations Group on the Information Society, which maps the Global Digital Compact objectives to existing World Summit structures, mechanisms, and activities, offering a structured approach for effective follow-up and implementation of the Compact. We request that the United Nations Group on the Information Society develop a joint implementation roadmap, to be presented to the Commission on Science and Technology for Development at its twenty-ninth session in 2026, to integrate the Global Digital Compact commitments into the World Summit architecture, ensuring a unified approach to digital cooperation that avoids duplication and maximizes resource efficiency.”

VII. Global Digital Compact

478. On 22 September 2024, Member States adopted the Pact for the Future at the Summit of the Future, along with its two annexes which includes the Global Digital Compact and the Declaration of Future Generations ([A/79/L.2](#); [A/RES/79/1](#)).
479. ITU contributed at every opportunity in the process to develop the Global Digital Compact (GDC), including in the thematic deep-dive consultations organized by the co-facilitators and providing keynote remarks and expert statements. ITU also contributed to the GDC online consultation process led by the UN Office of the Secretary-General's Envoy on Technology (OSET) and hosted roundtables in Geneva during the WSIS Forum 2023 for the co-facilitators to interact with civil society, technical community and private sector stakeholders and provided several opportunities during the WSIS+20 Forum High-Level Event 2024 to collect inputs from multistakeholders.
480. ITU is committed to playing its critical role in leading global digital transformation, aligned with the objectives of the GDC, which is an Annex to the Pact for the Future.
481. As follow-ups, ITU developed a Plan of Action to contribute to the GDC implementation by advancing inclusive and responsible digital development in line with its mandate and the WSIS framework. Ongoing efforts include the expansion of the Giga initiative, with over 40 countries now engaged to connect every school to the internet by 2030, and [the launch of the ITU-UNCTAD Digital Infrastructure Investment Catalyzer](#) at the Fourth International Conference on Financing for Development (FfD4), aiming to mobilize the roughly US \$1.6 trillion needed to address the critical digital infrastructure financing gap. ITU also advances the development of the UN AI Toolkit with UNESCO, UNDP and the UN Inter-Agency Working Group on AI, to strengthen global AI capacity building.
482. In July 2025, the AI for Good Global Summit and WSIS+20 High-Level Event 2025 – held in Geneva, brought together thousands of global participants and UN partners to advance dialogue on connectivity, digital skills, AI governance and standards. Key outcomes included the launch of the Global Initiatives on AI for Food Systems, new resources on multimedia authenticity standards, the AI standard exchange database, and the appointment of will.i.am as ITU Goodwill Ambassador to promote AI skills training for 10, 000 people, especially from developing countries. A high-level global dialogue on AI governance with 53 UN entities reinforced inclusive and sustainable AI development.
483. ITU co-leads with the UN Office for Digital and Emerging Technologies the Working Group on Digital Technologies (WGDT) – an inter-agency group supporting the implementation of the GDC and chapter 3 of the Pact for the Future. It is one of several Working Groups under the UN Steering Committee for Pact implementation, which is chaired by the UN Secretary-General.

484. Under ITU's leadership, the WGDT developed [the GDC Implementation Map](#), building on [the WSIS-2030 Agenda-GDC matrix](#), which was created by UNGIS. The GDC Implementation Map responds to the request in paragraph 71 of the GDC, and was submitted to the UN General Assembly as annexed to the UN Secretary-General's Report on WSIS on progress related to the implementation and follow-up of the outcomes of the WSIS at regional and international levels ahead of the WSIS+20 review.
485. The GDC Implementation Map outlines the implementation framework, including a shared vision, collaboration mechanisms, phased strategy, available resources, and monitoring and evaluation processes, as well as [detailed UN system initiatives](#) supporting the GDC and key milestones identified by the WGDT toward the High-Level Review of the GDC scheduled to take place during the eighty-second session of the UN General Assembly.
486. In addition to ITU's co-leadership of the WGDT, ITU continues to support the implementation of the Pact for the Future through active engagement in a number of the other Working Groups of the Pact Steering Committee - on SDGs, Peace and Security, Youth, and UN Governance Reform. For example, ITU co-leads the Pact's Action 27 (c) on bridging digital divides and contributes to Action 24 (b) on ICT-related crime prevention.

VIII. Final conclusions

487. ITU reaffirms its commitment to connecting the world and enabling inclusive digital transformation as one of the lead facilitating organizations of the WSIS Process. In 2025, ITU intensified its efforts to implement and promote the outcomes of WSIS through a range of initiatives that directly contribute to the SDGs. Across all four of its pillars—Radiocommunication (ITU-R), Standardization (ITU-T), Development (ITU-D), and the General Secretariat—ITU led and supported programmes that advanced digital inclusion, infrastructure, policy innovation, and capacity building. These efforts created tangible opportunities for multistakeholder collaboration, in line with the vision of a people-centered, inclusive, and development-oriented Information Society.
488. Over the past two decades, the WSIS Process and its components, especially the Forum has proven to be an efficient global multi-stakeholder platform that is open and inclusive for all to exchange knowledge and information, enhance collaborative networks, and scale good practices across regions and sectors.
489. The WSIS Action Lines continue to provide a practical framework for translating the digital development agenda into concrete outcomes. They have proven flexible and responsive to emerging challenges such as digital trust and safety, the rise of digital public infrastructure, the role of AI, cybersecurity, and the green digital transition. All stakeholders must continue to actively engage in the implementation of the Action Lines to ensure that digital technologies contribute to equity, resilience, and sustainability.
490. As the global community marks 20 years since the WSIS Summits in Geneva and Tunis, it is imperative to build upon the foundations of WSIS while adapting to a rapidly evolving digital landscape. The continued alignment between the WSIS Process, the 2030 Agenda for Sustainable Development, and broader UN digital cooperation frameworks is essential.
491. Going forward, ITU will work with all partners to strengthen the impact and visibility of the WSIS Process, reinforce the role of digital technologies as accelerators of the SDGs, and ensure the process remains inclusive, forward-looking, and rooted in multilateralism and multistakeholderism. As we enter the next phase of global digital cooperation, the WSIS+20 review provides a critical opportunity to renew political commitment, scale innovation, and ensure that no one is left behind in the digital future.