2019–2020

ITU-T ENVIRONMENT AND SMART SUSTAINABLE CITIES

Year in Review and Upcoming Activities

A Happy New Year and a big thank you to all our experts and contributors for your vital contributions!

OUR YEAR IN BRIEF

It has been an amazing year and we are thrilled to have been able to work with you, all our supporters, sharing our passion for advancing environmental smartness and sustainability through digital technologies. We are proud to have you with us.

During the year we have worked on many inspiring and innovation-driven projects, launching several initiatives, organizing some 30 events and publishing key new reports.

As the new year gets underway, we look forward to a host of new opportunities, discussions, meetings and activities together.

In the meantime, we are pleased to share with you this recap of our key activities in 2019, and details of what to look out for next. We look forward to our continued meaningful engagement during the year, to help promote and support transformative solutions for a sustainable future, and a transition towards a circular economy, for the benefit of all.

Our very best wishes for a successful 2020.

Sincerely,

ITU/TSB

WORKING TOGETHER

The ITU Telecommunication Standardization Sector (ITU-T) seeks to promote and support transformative solutions for a sustainable future and the transition towards a circular economy. It does this by raising awareness on information and communication technologies (ICTs) and digital technologies to tackle environmental challenges and build smarter and more sustainable cities in line with the UN Sustainable Development Goals (SDGs).

ITU-T employs a **contribution-led**, **consensus-based** approach to standards development in which all countries, companies and academia – no matter how large or small – are afforded equal rights to influence development of international standards. As part of its work, ITU-T regularly collaborates with other agencies at the UN, and organizes various knowledge-sharing forums and events.

ITU-T Study Groups assemble experts from all over the world to develop various international standards, known as ITU-T Recommendations, which act as defining elements in the global infrastructure of ICTs.

ITU-T Study Group 5 (SG5) is responsible for studies on the methodologies for evaluating ICTs' effects on climate change and for publishing guidelines on using ICTs in eco-friendly ways. The SG5 is also responsible for studying the design methodologies needed to reduce the adverse environmental effects from ICTs and e-waste.

ITU-T Study Group 20 (SG20) works to address the standardization requirements of Internet of Things (IoT) technologies, with a focus on IoT applications in smart cities and communities (SC&C) to address important urban-development challenges.

OUR ACTIVITIES AT A GLANCE

- ITU-T Study Group 5: Environment, Climate Change and Circular Economy

- ITU-T Study Group 5: Human Exposure to Electromagnetic Fields

- Focus Group on Environmental Efficiency for AI and Other Emerging Technologies

- ITU-T Study Group 20: Internet of Things, Smart Cities & Communities

- Smart Sustainable Cities Maturity Model

- United for Smart Sustainable Cities (U4SSC)

- U4SSC Management Team

- U4SSC Implementation Programme

- U4SSC City Science Application Framework

- U4SSC Key Performance Indicators for Smart Sustainable Cities Project

- New Report on Turning Digital Technology Innovation into Climate Action

- 9th Green Standards Week

- 1st Digital African Week

ITU-T STUDY GROUP 5 (SG5): ENVIRONMENT, CLIMATE CHANGE AND CIRCULAR ECONOMY

ITU-T Study Group 5 (SG5) studies how digital transformation can be shaped to ensure that it supports transitions towards more sustainable societies. To achieve this goal, ITU-T SG5 develops standards on the environmental aspects of various ICTs and digital technologies and the protection of the environment, including electromagnetic phenomena and climate change. ITU-T SG5 develops international standards, guidelines, technical papers and assessment frameworks that support the sustainable use & deployment of digital technologies, and that evaluate the environmental performance of various digital technologies such as, but not limited to, 5G, artificial intelligence (AI), smart manufacturing, automation, etc.

Additionally, ITU-T SG5 develops standards related to: resistibility, human exposure to electromagnetic fields, energy efficiency, and climate change adaptation and mitigation. ITU-T SG5 is also responsible for studying design methodologies and frameworks to reduce the volume and adverse environmental effects of e-waste and to support the transition towards a circular economy.

ITU-T STUDY GROUP 5 (SG5): ENVIRONMENT, CLIMATE CHANGE AND CIRCULAR ECONOMY

In 2019, ITU-T Study Group 5 (SG5) continued to develop standards and leverage global expertise to solve urgent issues related to the environment and climate change, and continued to advocate for main-streaming ecodesign and the circular economy.

33 new Recommendations were approved and 8 new Supplements were agreed in 2019, with 68 work items being developed by ITU-T SG5.

ITU-T SG5's main areas of expertise are:

- electromagnetic compatibility, lightning protection and electromagnetic effects

- ICTs related to the environment, climate change, energy efficiency and clean energy

- circular economy, including e-waste

ITU-T SG5 has 4 regional groups:

- SG5 Regional Group for Africa

- SG5 Regional Group for the Arab Region

- SG5 Regional Group for Latin America

- SG5 Regional Group for Asia and the Pacific

The next ITU-T SG5 meeting will take place from 10 to 19 March 2020 in Sophia Antipolis, France.

ITU-T STUDY GROUP 5 (SG5): HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Another key objective of ITU-T Study Group 5 (SG5) is to avoid health risks from electromagnetic fields (EMFs) by telecommunication devices and installations. In this regard, ITU-T SG5 develops standards, i.e. ITU-T Recommendations and guidelines for the protection of people exposed to EMF emitted by ICTs and digital technologies, taking into consideration existing EMF international standards dedicated to various electrical, electronic and related technologies. These standards provide operators, manufacturers and government agencies the tools required to assess EMF levels and to verify compliance with the World Health Organization

(WHO) recommended human exposure guidelines and limits. See the ITU-T Recommendations on Human Exposure to Electromagnetic Fields.

An EMF Guide and mobile application has also been launched to provide information and other educational resources on the EMFs.

Find out more on ITU-T SG5 and its current areas of activity here:
itu.int/en/ITU-T/studygroups/2017-2020/05/

Or contact us at tsbsg5@itu.int for further info.

Help spread the word! Do tell colleagues or partner organizations about the vital work of ITU-T SG5, or share this report!

FOCUS GROUP: ENVIRONMENTAL EFFICIENCY FOR ARTIFICIAL INTELLIGENCE AND OTHER EMERGING TECHNOLOGIES (FG-AI4EE)

In May 2019, ITU established a new focus group that provides a global platform to raise awareness on the environmental impacts of artificial intelligence (AI) and other frontier technologies, as well as the technologies' ability to contribute to achievement of the UN Sustainable Development Goals (SDGs) and the objectives of the Paris Agreement.

FG-AI4EE is developing several technical reports & technical specifications to address environmental efficiency as well as water and energy consumption of emerging technologies, and provides guidance to stakeholders on how to operate these technologies in a more environmentally efficient manner.

The 1st meeting of the FG-AI4EE took place on 12 December 2019 in Vienna, Austria, where a series of deliverables were agreed within 3 new working groups (WG):

WG1: Requirements of Artificial Intelligence (AI) and Other Emerging Technologies to Ensure Environmental Efficiency

WG2: Assessment and Measurement of the Environmental Efficiency of Artificial Intelligence (AI) and Emerging Technologies

WG3: Implementation Guidelines of Artificial Intelligence (AI) and Emerging Technologies for Environmental Efficiency

The next FG-AI4EE meeting will take place in 1st quarter of 2020 in Geneva, Switzerland.

ITU-T STUDY GROUP 20 (SG20): INTERNET OF THINGS, SMART CITIES & COMMUNITIES

ITU-T Study Group 20 (SG20) provides the specialized IoT standardization platform necessary for cross-sector convergence to rest on a cohesive set of international standards. ITU-T SG20 is working to address the standardization requirements of Internet of Things (IoT) technologies by developing international standards to enable their coordinated development, including the machine-to-machine communications and ubiquitous sensor networks. Central to ITU-T SG20's study is the standardization of end-to-end architectures for IoT, and mechanisms for the interoperability of IoT applications and data sets being employed by vertically-oriented industry sectors.

Another important aspect of ITU-T SG20's work is the development of standards that leverage IoT technologies to address urban-development challenges.

Indeed, IoT is also a key enabler of the smart society and offers an opportunity to transform city infrastructures, benefiting from efficiencies of intelligent buildings and transportation systems, and smart energy and water networks.

ITU-T SG20 is assisting many governments and industry in capitalizing on this opportunity, providing a unique platform to influence the development of international IoT standards and their application as part of urban-development master plans.

ITU-T STUDY GROUP 20 (SG20): INTERNET OF THINGS, SMART CITIES & COMMUNITIES

In 2019, ITU-T SG20 developed a series of standards to address the standardization requirements of Internet of Things (IoT) technologies, with a focus on IoT applications and challenges in smart cities and communities (SC&C).

90 work items are currently under development at ITU-T SG20. 18 Recommendations were approved and 3 Supplements were agreed in 2019.

ITU-T SG20's main areas of expertise are:

- IoT and its applications

- smart cities and communities (SC&C), including their e-services and smart services

- IoT identification

ITU-T SG20 has 4 regional groups:

- SG20 Regional Group for the Africa Region

- SG20 Regional Group for the Arab Region

- SG20 Regional Group for the Latin America Region

- SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia

The next ITU-T SG20 meeting will take place in Geneva, Switzerland from 6 to 16 July 2020.

SMART SUSTAINABLE CITIES MATURITY MODEL (SSC-MM)

ITU-T Study Group 20 (SG20) has developed a SSC maturity model as part of ITU-T Recommendation Y.4904 to identify the goals, levels and key measures recommended for cities to effectively examine their current situation and to determine the critical capabilities needed to progress toward the goal of becoming smart and sustainable. The SSC-MM's aim is to help cities and their stakeholders to develop a common language, improve intra- and inter-city collaboration in defining and executing their city development strategies, and promote and encourage the use of emerging technologies and solutions.

The objectives of the SSC-MM include:

- describing general SSC goals, recognizing that these will vary from city to city;

- assessing the current situation in developing smart sustainable cities;

- assisting in formulating a development strategy and outlining necessary milestones;

- learning the challenges and global best practices in developing SSCs; and

- helping cities to self-evaluate and enabling them to share their results with other cities.

Find out more on ITU-T SG20 and its current areas of activity here:
itu.int/en/ITU-T/studygroups/2017-2020/20/

Or contact us at tsbsg20@itu.int for further info.

Help spread the word! Do tell your colleagues or partner organizations about the vital work of ITU-T SG20, or share this report!

UNITED FOR SMART SUSTAINABLE CITIES (U4SSC)

United for Smart Sustainable Cities (U4SSC) is a UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by CBD, ECLAC, FAO, ITU, UNDP, UNECA, UNECE, UNESCO, UN Environment, UNEP-FI, UNFCCC, UNIDO, UNU-EGOV, UN-Women and WMO to achieve Sustainable Development Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable".

In 2019, U4SSC continued to advocate public policy to encourage the use of digital technologies toward facilitating and easing transition to smart sustainable cities (SSC). It works on 11 thematic groups:

- Guidelines on tools and mechanisms to finance SSC projects

- Guidelines on strategies for circular cities

- Guiding principles for AI in cities

- Impact of frontier technologies in cities

- Simple ways to be smart

- Practitioner guide to measure SC&C

- Practitioner guide to monitor SC&C

- Procurement guidelines for SSC

- City platforms

- United for Smart Sustainable Cities Index

- Blockchain 4 cities

To find out more on the U4SSC initiative, visit: itu.int/go/u4ssc

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U4SSC MANAGEMENT TEAM

U4SSC IMPLEMENTATION PROGRAMME (U4SSC-IP)

The U4SSC initiative's Implementation Programme (U4SSC-IP) supports the implementation of U4SSC KPIs across cities – carrying out projects and building vital partnerships for creating smarter and more sustainable cities worldwide. Its projects include:

- Data for Cities – A Pragmatic Approach

- Global City Solutions Marketplace

- Data Management Platform including City/KPI Dashboard

- Innovation & Co-Creation LAB Vienna

- Innovation & Co-Creation LAB Ålesund

- Global City Simulation Tool

- Digital Co-Creation Toolbox and blue print for city solutions

- Smart City Guide and business platform

- National U4SSC Programme Norway

- City SDG Intelligence Tool

- U4SSC Country Hubs

- Twin City Program

- E-Mobility Energy Calculator

U4SSC CITY SCIENCE APPLICATION FRAMEWORK

The U4SSC initiative also launched an important new publication: the City Science Application Framework, which provides a four-step methodology for cities to solve their most pressing urban challenges. It provides 8 varied case studies:

- Air quality management in Southern California, United States

- Smart Dubai Happiness Meter in Dubai, United Arab Emirates

- Fine dust filtration in Stuttgart, Germany

- Crime prediction for more agile policing in cities in Rio de Janeiro, Brazil

- Data-driven energy savings: Hyperdome shopping centre in Queensland, Australia

- Smart Dubai: Rashid, City Concierge in Dubai, United Arab Emirates

- Identifying the cascading effects on vital objects during flooding in Amsterdam, the Netherlands

- Unlocking the potential of trust-based AI for city science and smarter cities

U4SSC KEY PERFORMANCE INDICATORS FOR SSC PROJECT

In 2019, the United for Smart Sustainable Cities (U4SSC) Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) project continued to assess cities to evaluate their urban functionalities, improve the quality of life for their citizens, and ensure global environmental, economic and social sustainability.

KPIs for Smart Sustainable Cities

The International Telecommunication Union (ITU)

The U4SSC KPIs for SSC project developed a new publication series this year. This included the launch of the City Snapshot report for:

- Ålesund, Norway
- Riyadh, Saudi Arabia
- Bizerte, Tunisia
- Moscow, Russia

The series also includes the City Verification Report, the City Fact Sheet report and the City Case Study.

Also as part of the launch, a new Verification Report was introduced for Pully, Switzerland.

Why not help improve quality of life for your citizens or evaluate the urban functionality of your own city by piloting the U4SSC KPIs? Contact us at u4ssc@itu.int to find out more!
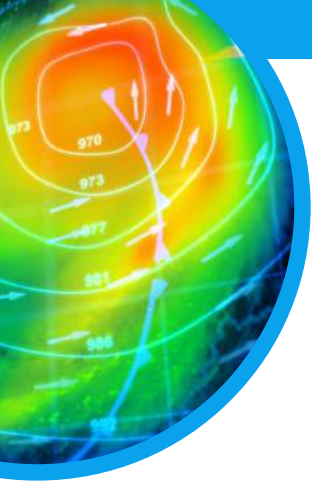
NEW REPORT: TURNING DIGITAL TECHNOLOGY INNOVATION INTO CLIMATE ACTION

In September 2019, ITU launched its new report on 'Turning Digital Technology Innovation into Climate Action' at the 2019 United Nations Climate Action Summit in New York, USA. It is a call to action, a testament to the power of technology and a belief in the idea that together we can leverage information and communication technologies (ICTs) to address the urgent threat of climate change.

The report points to what is being done to understand the Earth's systems, reduce greenhouse gas emissions and build resilience to the climate crisis – from using space sensing observation to track deforestation, to the development of smart grids to accelerate energy transition, or strengthening early warning systems against the rising number of extreme weather events.

It is clear that digital technologies can offer solutions to monitor, mitigate and adapt to the impacts of climate change – although these must be wisely deployed, to ensure that their environmental impact is a positive one. It is vital that we turn the digital revolution into climate action – before it is too late.

9TH GREEN STANDARDS WEEK

ITU, plus over 25 partners, organized the ninth Green Standards Week (GSW) in València, Spain from 1 to 4 October 2019. The GSW acts as a global platform where various policy experts, city planners, regulators, standards experts, and civil societies, among others can come together to discuss the role of ICTs and frontier technologies in facilitating smart sustainable cities (SSC) and achieving a circular economy.

The GSW concluded with a **Call to Action** to:

- connect smart sustainable cities (SSC) with the Sustainable Development Goals (SDGs);
- make cities lead the way in application of frontier technologies to protect the environment and tackle climate change;

- use international standards as guidance for smart sustainable cities development;
- adopt the circular economy principles to reduce e-waste;
- implement a smart city platform to integrate smart technologies;
- take a proactive stance to study the environmental performance of frontier technologies;
- involve citizens, researchers and other stakeholders in developing standards and technologies to meet end-user needs;
- adopt digital rights principles to ensure the inclusion of all people in SSC development;
- accelerate SSC transformation through a circular strategic approach; and
- understand that the 2030 Agenda can only be met if we work together by boosting partnerships and mobilizing expertise.

First Digital
African Week

27-30 August 2019
Abuja, Nigeria
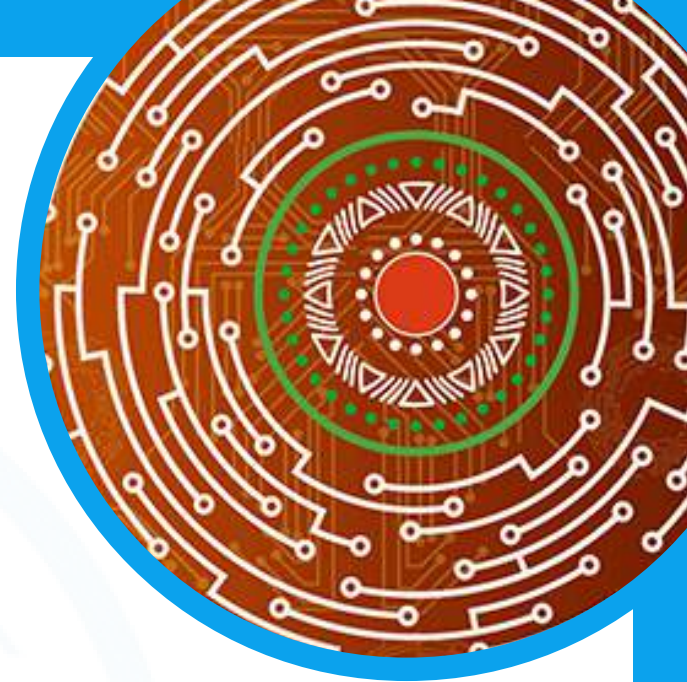
1ST DIGITAL AFRICAN WEEK

ITU, at the kind invitation of the Nigerian Communic-ations Commission, organized the 1st Digital African Week (DAW) from 27 to 30 August 2019 in Abuja, Nigeria.

The 1st Digital African Week brought together over 150 leading specialists in the field, from top policy-makers to engineers, designers, smart city planners, government officials, regulators, standards experts, academia and other stakeholders to debate the role of new frontier technologies to address the development challenges and build a Smart Sustainable Africa.

The Digital African Week provided an essential opportunity to share best practices, discuss new trends and raise awareness on the vital importance of international standards in order to unlock the potential of a circular economy. It also provided an overview of EMF, 5G and health issues to policy makers and other key stakeholders with a special focus on Africa.

CONTACT US:

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FURTHER LINKS:

For more information on ITU and digital solutions to tackle climate change and forge a sustainable future, visit: itu.int/es/action/climate/

For more information on ITU-T, climate change and circular economy, visit:
itu.int/en/ITU-T/climatechange/

For more information on smart sustainable cities, visit: itu.int/en/ITU-T/ssc/

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