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Contribution by ITU

to the CSTD 2022-2023 priority themes on “Technology and innovation for cleaner and more productive and competitive production” and “Ensuring safe water and sanitation for all: a solution by science, technology and innovation”

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ITU RESPONSE: UNCTAD Request for inputs for CSTD 2022-2023 Priority Themes (IOs and RCs)

PRIORITY THEME 1: Technology and innovation for cleaner and more productive and competitive production

1. What are some specific examples (from the public and private sectors) of green technology and innovation for cleaner and more productive and competitive production in your member countries? Please include contact, website, link to reports and any other relevant information concerning these projects and initiatives.
 - a. Public and private sectors have made headway on green technology and innovation for cleaner and more productive and competitive production. In particular by implementing international standards such as the ones developed with the ITU-T. ITU participated in the [High Level Dialogue on Energy](#) which highlighted key case studies from public and private sectors initiatives on technology and innovation as it related to cleaner production. For example, China has implemented Recommendation [ITU-T L.1381 'Smart energy solutions for data centres'](#) which considers a smart control strategy for the entire energy system, including power-feeding and cooling solutions, of data centres to achieve higher energy efficiency and to decrease overall energy consumption. This case study highlighted the urgent need to focus on the energy aspect of technology itself. As a result, the power usage effectiveness of a data centre in this case is reduced to 1.15 and the annual electricity expense is also reduced by 12.2%. 4.91 million kWh of electricity with 2215 tce/a of energy being saved every year, reducing carbon dioxide emissions by 4724 tons.
 - b. ITU together with the Global Enabling Sustainability Initiative (GeSI), GSMA and SBTi developed [Recommendation ITU-T L.1470 "GHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement"](#). This standard offers guidance on the pathway towards net zero emissions for the ICT industry. Currently, ITU is collaborating with GeSI and GSMA on developing guidance on measuring and reporting scope 3 emissions for companies in the ICT sector, particularly for mobile and fixed line network providers, data centre operators, cloud service and software providers, and suppliers of manufactured ICT equipment.
 - c. Under the [Global E-waste Statistics Partnership \(GESp\)](#), ITU and UNITAR-SCYCLE monitor developments of e-waste over time and help countries produce e-waste statistics. [Global, regional and national e-waste monitors](#) provide up-to-date information on the amounts of e-waste generated and recycled, and provides information on the progress made in terms of policy, legislation and regulation. Regional E-waste Monitors for [Latin America, CIS + Georgia](#) and the [Arab States](#) involved close collaboration with country focal points to collect information on e-waste statistics, legislation, and e-waste management infrastructure.
 - d. [Greening digital companies: Monitoring emissions and climate commitments](#) jointly authored by ITU and the World Benchmarking Alliance, documents emissions and energy use of 150 of the world's leading tech companies. Beyond assessing corporate climate data and targets, the report highlights best practices for digital companies to slash their emissions and achieve carbon-neutral operations. The report finds that 150 digital companies consumed 1.6 per cent of global electricity production in 2020, 9 companies headquartered in East Asia accounted for half of all the emissions of the 150 reviewed in the report, only 16 companies are already carbon neutral and the purchasing power of digital companies helps scale up renewable energy markets.
 - e. [WSIS Stocktaking database](#), coordinated by ITU since 2004, has been collecting information and communication projects that are contributing to the implementation of WSIS Action Lines, including those for cleaner and more productive and competitive production, which serve as examples of good practice from the ground.

- i. So far more than 200 ICT e-Environment applications have been submitted to this international repository supporting sustainable development, out of which 37 projects were submitted in 2022. The importance of the topic and dedication of the stakeholders to cleaner environment using ICTs has been particularly increasing in the recent years with 145 projects submitted in the last 5 years, 75% of all submitted projects in the e-Environment category.
 - ii. Ten ICT projects submitted in 2022 focused on increasing competitiveness, including [Industrial Cluster 4.0](#) in Mexico, [IT Park](#) in Uzbekistan, [Technological Park of São José dos Campos](#) in Brazil, project under PROMIS [PeRformance Operational and Multilingual Interactive Services to support Inclusion and Compliance Internationally](#) in Italy, [Digital Transformation of Small & Medium Business Enterprises](#) project under Ministry of Communication and Information Technology in Qatar, Exporting Malaysia's Professional & High Value Services Via Digital Freelancing under Malaysia Digital Economy Corporation Sdn. Bhd, [Energy Demand Management](#) under Endeema in Germany. For more details, explore the global [WSIS Stocktaking Report 2022](#).
2. What are the national strategies, policies, and laws concerning green technology and innovation for cleaner and more productive and competitive production in your member countries or region?
 - a. The ITU-T plays a vital role in establishing the trajectory and standardizing digital transformation in cities supporting technology and innovation for cleaner and more productive and competitive production.
 - b. [Study Group 5 on environment, climate change and circular economy](#) has developed and published international standards such as:
 - i. Environmental efficiency of digital technologies
 1. [ITU-T L.1317](#) Guidelines on energy efficient blockchain systems
 2. [ITU-T L.1331](#) Assessment of mobile network energy efficiency
 - ii. Smart Energy Solutions
 1. [ITU-T L.1380](#): Smart energy solution for telecom sites
 2. [ITU-T L.1381](#): Smart energy solutions for data centres
 3. [ITU-T L.1382](#): : Smart energy solutions for Telecommunication Room
 4. [ITU-T L.1383](#): : Smart energy solutions for city and home applications
 - iii. Circular Economy and E-Waste
 1. [ITU-T L.1000](#) Universal power adapter and charger solution for mobile terminals and other hand-held ICT devices
 2. [ITU-T L.1023](#) Assessment method for circular scoring [ITU-T L. 1031](#): Guideline for achieving the e-waste targets of the connect 2030 agenda.
 - c. ITU creates a circular economy for electronics, such as through improving expertise in the collection of e-waste data, increasing coverage of national e-waste policy and regulation, and identifying and mapping technological interventions in the e-waste management space. Currently, ITU is providing technical assistance to Botswana, Dominican Republic, Namibia, Rwanda, The Gambia, and Uzbekistan on [Implementing the EPR Concept in Policies and Regulations for the Sound Management of E-waste](#). Member States can [request ITU technical assistance](#) and capacity building to support national or regional e-waste policy development.
 - i. In [Rwanda](#), a national level awareness raising campaign was launched in May 2022 with the aim of increasing collection of e-waste at dedicated drop-off points and sensitize the population on the issue of e-waste. ITU in collaboration with UNEP and also with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) will continue supporting Rwanda in the revision of the regulation governing e-waste management and development of the ministerial order on e-waste, study into the financial mechanisms possible for EPR in

Rwanda, development of an e-procedure and e-registration platform for EPR in Rwanda and finally the preparation of EPR Implementation Guidelines to support the regulation on governing e-waste management and the ministerial order on e-waste.

- ii. In [Malawi](#), a national e-waste policy is being finalized before a validation workshop planned for later in 2022.
- d. WSIS Forum, established in 2009 as a platform for sharing information and knowledge about ICTs making social, economic, cultural and environmental impact achieving sustainable development goals, is witnessing an increased number of sessions and workshops that discuss the impact of ICTs and innovation for cleaner and more productive and competitive production and vice-versa, organized by WSIS stakeholders and ITU membership sharing national strategies, policies, laws, programmes and initiatives. In [WSIS Forum 2022](#), out of 200 sessions more than 10 sessions focused on environmental policies and strategies on local, national and international level, including the following:
 - i. [High-Level Policy Session 6: Climate Change/Bridging Digital Divides](#)
 - ii. [High-Level Policy Session 5: ICT Applications and Services](#)
 - iii. [High-Level Policy Session 7: Inclusiveness, Access to Information and Knowledge for All / Bridging Digital Divides](#)
 - iv. [High-Level Policy Session 1: Bridging Digital Divides](#)
 - v. [WSIS Action Line Facilitators Meeting C7: E-Environment](#)

While 6 high-level sessions discussed the ICTs role in advancing competitiveness and increased productivity, including the following:

- vi. [High-Level Policy Session 8: Enabling Environment](#)
- vii. [High-Level Dialogue: ICTs for Developing Countries \(and LDCs\)](#)
- viii. [Interactive High-Level Dialogue with Mayors on Smart Cities, Drivers of Innovative Sustainable Development](#)
- ix. [Academia Round Table](#)
- x. [IEEE Knowledge Cafe](#)

Explore Agenda and Program at the dedicated [webpage](#). Also, visit the [Outcomes and Highlights](#) to learn more.

WSIS Forum 2023 will feature a special track on Clean Technologies at the request of stakeholders.

3. What are the key industries that are pioneering green innovation in your member countries or region? List the key actors in the national ecosystem of innovation related to green innovation in your member countries or region (firms, universities, financial institutions, regulators)? What are the key networks of the ecosystem in your region (including online networks, innovation hubs, forums, etc.)?
 - a. The telecommunication industry is becoming increasingly well-positioned as the infrastructural linchpin for countless digital technologies that support green innovation globally. Telecoms are key actors in the national ecosystem of innovation related to green innovation.
4. What are the challenges that governments in your region (or from your member countries) have faced or may face in promoting green technology and innovation in your country to contribute to national development priorities and accelerate the progress towards the SDGs?
 - a. There has been significant uptake of green technology globally, however there are challenges in the uptake of green technology in less developed nations. These challenges can include
 - i. Financial resources – the introduction of green technologies in new markets usually requires significant and sustain funding
 - ii. Policy incentives and economic instruments – the development and diffusion of green technologies significant benefit from policy incentives.
 - iii. Technological infrastructure – introducing new green technology requires significant infrastructure to support development and deployment. Today, 2.9

billion people remain offline¹ and one of ITU's key tasks is to connect the unconnected, and to build a digitally competent society for a sustainable future.

- iv. Access to information and awareness – understanding the variety of green technologies in the marketing can be a challenge to developing countries.
5. What should governments, the private sector, organized civil society, and other stakeholders do so that developing countries can benefit from these technologies?
 - a. Tackling environmental, economic and social impacts of climate change requires a significant transformation across all sectors. Governments must support investment of green technologies and innovation. They must understand the availability of technology and the numerous solutions available in the market. Governments must also allow developing countries to take part in the discussion about the international discussion on standardization.
 - b. ITU provides a platform where diverse [membership](#) (international organisations, research institutions, academia etc.) can come together to develop international standards that help support developing countries with regard to digital transformation. Initiatives such as the United for Smart Sustainable Cities, the annual WSIS Forum and the WSIS Stocktaking database provide an open platform for knowledge sharing on how cities around the world can benefit from digital technologies.

To actively participate and contribute to the global discussions, such as the WSIS Forum. It has proven to be an efficient mechanism for coordination of multi-stakeholder implementation activities, information exchange, creation of knowledge, sharing of best practices and continues to provide assistance in developing multi-stakeholder and public/private partnerships to advance development goals. The WSIS Forum is the only event of its kind where the programme and agenda are completely crowdsourced. The start of the Open Consultation Process on thematic aspects and innovations on the format of WSIS Forum 2023 will soon be launched. The process actively engages governments, civil society, the private sector, academia, the technical community and regional and international organizations in the preparatory process to ensure broad ownership and further.

6. What are some examples of international cooperation mechanisms, projects, programmes or strategies, including triangular and South-South cooperation, in green technology and innovation that your organization contribute or is part of?
 - a. ITU-T [Study Group 5 on environment, climate change and circular economy](#) has supported technology and innovation for cleaner and more productive and competitive production in numerous ways such as:
 - i. International Standards
 1. [Recommendation ITU-T L.1380](#) focuses on smart energy solutions for telecom sites, mainly on the performance, safety, energy efficiency and environmental impact, when the system is fed by various types of energy such as photovoltaic (PV) energy, wind energy, fuel cells and the grid. The Recommendation also considers smart energy control; for example, if the grid is off, how can the energy flows be managed to achieve higher energy efficiency, how to get green energy, etc.
 2. [Recommendation ITU-T L.1383](#) focuses on smart energy solutions in different application scenarios facilitating energy saving and carbon emission reduction. Besides their application in the field of ICT, such as in base stations, data centres and telecom centres, smart energy solutions have been applied in cities and homes as an advanced update to ICTs.
 3. [Recommendation ITU-T L.1220](#) introduces the standard for innovative energy storage technology for stationary use. This Recommendation

¹ <https://www.itu.int/itu-d/reports/statistics/facts-figures-2021/>

- introduces an open series of documents for different families of technologies (e.g., battery systems, super-capacitor systems).
4. [Recommendation ITU-T L.1470](#) provides detailed trajectories of greenhouse gas (GHG) emissions for the global information and communication technology (ICT) sector and sub-sectors that are quantified for the year 2015 and estimated for 2020, 2025 and 2030.
- ii. ITU-T Study Group 5 [Regional Groups](#)
 1. SG5 has regional groups with representatives from the Asia and Pacific, Africa, Arab, and Latin America regions. These are important platforms that enable us to understand the unique context and priorities of those regions and making sure that their voices are heard in our standard development process.
 - iii. U4SSC
 1. The [United for Smart Sustainable Cities \(U4SSC\)](#) is a global UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by 14 UN bodies to provide an international platform for information exchange and partnership building to guide cities and communities in achieving the UN Sustainable Development Goals. This initiative highlights international cooperation that supports green technology and innovation globally.
 - iv. ITU-T Focus Groups
 1. [Focus on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies](#) (FG-AI4EE) which identifies the standardization needs to develop a sustainable approach to AI and other emerging technologies including automation, augmented reality, virtual reality, extended reality, among others. The Focus Group develops technical reports and technical specifications to address the environmental efficiency, as well as water and energy consumption of emerging technologies, and provide guidance to stakeholders on how to operate these technologies in a more environmentally efficient manner to meet the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.
 2. [Focus Group on Artificial Intelligence \(AI\) and Internet of Things \(IoT\) for Digital Agriculture](#) (FG-AI4A) explore the potential of emerging technologies including AI and IoT in supporting data acquisition and handling, improving modelling from a growing volume of agricultural and geospatial data, and providing effective communication for interventions related to the optimization of agricultural production processes.
 - v. [The Global E-waste Statistics Partnership](#) is a partnership managed by ITU and UNITAR-SCYCLE to monitor developments of e-waste over time, and to help countries to produce e-waste statistics using an internationally adopted measurement framework.
 - vi. [The E-waste Coalition](#) was formed by several UN agencies to pave the way for greater collaboration in the area of e-waste management under advocacy, knowledge and joint implementation.
 - vii. [The Circular Electronics Partnership \(CEP\)](#) brings together key leaders from across the electronics value chain to drive a coordinated transition towards an economically viable circular industry. In enabling a circular economy, the partnership enshrines the principle of maximizing the value of products, components and materials throughout their full life cycle, using safe and fair labour and depending only on circular resources.
 - viii. [UN4NAPs](#) is a UN-wide partnership initiative which enables organizations to respond to technical requests identified by any country that is in the process of formulating or implementing its National Adaption Plans.
 - ix. The Digital Public Goods Alliance (DPGA) issued a call and a [report](#) for weather, climate & hydrological information datasets to be made open and freely available as digital public goods. This was driven by the efforts of the DPGA's Climate

Change Adaptation Community of Practice that focused on DPGs with the potential to impact climate and weather services.

- x. In line with ITU's mandate and the WSIS outcome documents, the ITU continues playing key role in WSIS implementation and follow-up, including:
 - 1. [WSIS Implementation](#), WSIS Forum, WSIS Stocktaking as a Leading Facilitating Organization

WSIS Action Lines as Co-Facilitator for e-Environment: ICT applications can support sustainable development, in the fields of public administration, business, education and training, health, employment, agriculture, science, and in this particular regard, field of green technology and innovation as part of e-environment. ITU has been working closely with the lead facilitator WMO and other co-facilitators UNEP, UN-Habitat and ICAO.

- 7. What actions can the international community, including the CSTD, take to help developing countries take advantage of green technology and innovation for cleaner and more productive and competitive production?
 - a. ITU and the CSTD, can help developing countries take advantage of green technology and innovation for cleaner and more productive and competitive production by:
 - i. Raising awareness of green technologies and innovation
 - ii. Creating synergies and cross-sector collaborations
 - iii. Supporting the development of learning and education of STI
 - iv. Bridging the standardization gap and help communities to develop and implement international standards
- 8. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further input or invite some of them as speakers for the CSTD inter-sessional panel and annual session.
 - a. [Study Group 5 Management Team](#)
 - i. Mr Dominique Wurgess, ITU-T SG5 Chairman
 - ii. Mr Gemma Paolo - WP2/5 Chairman
 - iii. Ms Shuguang QI – WP3/5 Chairman
 - b. ITU-D Environment team (eedmail@itu.int) and more specific contacts can be shared related to the projects/policies mentioned.
 - c. WSIS Team at wsis-info@itu.int for all WSIS-related matters, Ms Gitanjali Sah (Gitanjali.sah@itu.int) and Mr Vladimir Stankovic (Vladimir.stankovic@itu.int) as lead coordinators.
- 9. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?
 - a. [Frontier technologies report](#)
 - b. ITU together with 11 UN entities and ITU-T [Study Group 20 on the Internet of things \(IoT\) and smart cities and communities \(SC&C\)](#) has recently launched a [Toolkit on Digital Transformation for People-Oriented Cities and Communities](#) which supports strategizing and planning the digital transformation of cities and communities to promote sustainable, inclusive, resilient and improved quality of life for residents in cities and communities. The Toolkit highlights relevant resources that help support technology and innovation for cleaner and more productive and competitive production
 - c. [Greening digital companies: Monitoring emissions and climate commitments](#)
 - d. [Digital Public Goods Alliance Climate Change Adaption Call for Action and Report](#)
 - e. [Digital solutions for a circular electronics value chain](#)
 - f. [Internet Waste](#)
 - g. [Turning digital technology innovation into climate action](#)
 - h. [Global E-waste Monitor 2020](#).
 - i. [Regional E-waste Monitor for the CIS + Georgia 2021](#)
 - j. [Regional E-waste Monitor for the Arab States 2021](#)

- k. [Regional E-waste Monitor for Latin America 2022](#)
- l. [Policy practices for e-waste management, 2021](#)
- m. [WSIS Forum 2022: Outcome Document](#)
- n. [WSIS Forum 2022 High Level Track Outcomes and Executive Brief](#)
- o. [WSIS Stocktaking Report 2022](#)
- p. [WSIS Forum 2022 and SDG Matrix](#)
- q. [WSIS Stocktaking Success Stories 2022](#)
- r. [WSIS Forum 2022: Report - WSIS Action Lines: Building back better from the coronavirus disease \(COVID-19\) while advancing the full implementation of the 2030 Agenda for Sustainable Development.”](#)
- s.

PRIORITY THEME 2: Ensuring safe water and sanitation for all: a solution by science, technology and innovation

1. Can you give examples of projects/policies in your organization helping countries improve the management of water and sanitation and provide access to safe water and sanitation for all? What are the main challenges confronted (including the gender dimension) while trying to implement these projects/policies?
 - a. Economic growth, climate change and rising populations are all affecting the availability of water resources. Economic growth, seasonal climatic conditions and rising population are all affecting the availability of water resources. Moreover, a number of effects linked to climate change, such as lengthy droughts and extreme weather events, are worsening the situation.
 - b. ITU-T is setting the standard for smart water management to support access to safe water and sanitation, globally. International standards such as the ones developed by ITU help countries, cities and organizations better understand water management, identify the infrastructure needed to support smart water management and how to implement various policies and measures accordingly.
 - c. Below are a handful of standards and guidelines to this regard:
 - i. [L.Sup14 : ITU-T L.1500 - Standardization gap analysis for smart water management](#) - identifies gaps on standardization for smart water management (SWM), taking into consideration related information and communication technology (ICT) standardization activities currently undertaken by the various standards development organizations (SDOs) and forums.
 - ii. [Y.Sup36 : ITU-T Y.4550-Y.4699 - Smart water management in cities](#) - provides municipalities, decision-makers and interested stakeholders with an overview of the main technical aspects that need to be considered to effectively design and implement smart water management in cities.
 - iii. [ITU-T F.747.1 Capabilities of ubiquitous sensor networks for supporting the requirements of smart metering services](#) - identifies the capabilities of ubiquitous sensor networks (USNs) for supporting the requirements of smart metering services.
 - iv. [L.Sup15 : ITU-T L.1500 series - Requirements for water sensing and early warning systems](#) –
 - d. [Development of spatial data infrastructure for analyzing and monitoring ecological condition in the Central Asia](#) (in Russian)
 - e. Through WSIS Forum and WSIS TalkX, stakeholders have an opportunity to showcase examples of projects/policies of the management of water and sanitation and provide access to safe water and sanitation for all. Explore latest WSIS Forum Agenda and Program organized in 2022 to learn more about this topic.

2. Could you share specific examples that have successfully used STI, including frontier technologies (e.g., AI, drones, etc) or other forms of innovation in general in addressing the above challenges?
 - a. The ITU recently published a key resource on [Frontier technologies to protect the environment and tackle climate change](#) that highlights successfully implemented frontier technologies to

- address the issues surrounding water management. The report features a case study from Singapore who implemented 5G technology to enable smart, real-time monitoring of urban water supply systems and decreases in apparent and real water losses. The report examines Singapore's smart water grid and supply management system (WaterWise), which uses hundreds of sensors and data analytic tools to detect leaks and monitor water pressure, flow and quality in the network, helping to reduce unaccounted water loss and improve planning, operations and cost savings via energy optimization.
- b. The United for Smart Sustainable cities Initiative published a report on [Connecting cities and communities with Sustainable Development Goals](#) which describes successful examples of STI in addressing water management. In particular, a use case on the SmartH2O project that developed an ICT Platform. The SmartH2O platform will enable water managers to close the loop between actual water consumption levels and desired targets, using information about how consumers adapt their behaviour to new situations: new regulations, new water prices and appeals to water savings. This feedback will allow WDM policies to be aptly revised, enabling water and energy-saving goals to be maximised. The SmartH2O project also caters to SDG 6 as it promotes the sustainable consumption of water.
 - c. WSIS Stocktaking database, coordinated by ITU since 2004, has been collecting information and communication projects that are contributing to the implementation of WSIS Action Lines, including those for ensuring safe water and sanitation for all, which serve as examples of good practice from the ground. Some examples of ICT projects available in the global WSIS Stocktaking Report 2022 include
 - i. 5G Green and Sustainable Human Settlements <http://hy.10086.cn/#/> The project is under China Mobile (Hangzhou) Information Technology Co., Ltd. in China.
 - ii. Advanced Meter Infrastructure <https://www.km.qa/Pages/default.aspx> The project is under Qatar General Electricity & Water Corporation "Kahramaa" in Qatar.
 - iii. Big Bata Management Platform For Ecological Environment Monitoring In Gansu Province <http://www.chinatelecom.com.cn/> The project is under China Telecommunications Corporation in China.
 - iv. Digital Flood Forecasting System <https://g.co/floodalerts> The project is under Bangladesh Water Development Board in Bangladesh.
 - v. 5G+AI Smart Rice Cultivation Project <http://www.sh-tramy.com/> The project is under China Telecommunications Corporation in China.
 - vi. Agriculture Holdings Platform (HSR) <https://hsr.mewa.gov.sa/> The project is under Ministry of Environment Water and Agriculture in Saudi Arabia.
 - vii. Agri-Environmental Guidance Application https://www.my.gov.sa/wps/portal/snp/aboutksa/environmentalProtection!/ut/p/z/0/04_Sj9CPyKssy0xPLMnMz0vMAfIjo8zivQIsTAWdDQz9LSw8XQ0CnT0s3JxDfA0M_A30g1Pz9AuyHRUBPXGyKQ!!/ The project is under Ministry of Environment Water and Agriculture in Saudi Arabia.
 - viii. AGRIOTEC <http://agriotec.com/en> The project is under Ministry Of Telecom & Info.Tech in Palestine
 - ix. Open Science on High Quality Geographical Products (Indications) for Environment and Sustainability <http://www.geodoi.ac.cn/gies> The project is under Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences in China.
 - x. Finapp Cosmic rays neutron sensing <https://www.finapptech.com> The project is under Finapp srl in Italy.
3. Can you provide examples of policies/projects/initiatives specifically aimed at strengthening national STI capabilities to address these challenges?
 - a. The ITU-T Study Group 5 has established a [Focus on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies](#) (FG-AI4EE) which identifies the standardization needs to develop a sustainable approach to AI and other emerging technologies including

automation, augmented reality, virtual reality, extended reality, among others. The Focus Group develops technical reports and technical specifications to address the environmental efficiency, as well as water and energy consumption of emerging technologies, and provide guidance to stakeholders on how to operate these technologies in a more environmentally efficient manner to meet the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.

- b. The [United for Smart Sustainable Cities \(U4SSC\)](#) is a global UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by 14 UN bodies to provide an international platform for information exchange and partnership building to guide cities and communities in achieving the UN Sustainable Development Goals. This initiative strengthens national STI capabilities to help address challenges surrounding water management at the city level.
 - c. WSIS Process, WSIS Forum and other WSIS-related processes and activities have been providing a platform to share knowledge and information, promote best practices in all segments of life, including matters of sanitation and safe water, particularly since 2015 when the WSIS-SDG Matrix was developed by UN experts to create meaningful linkages between WSIS Action Lines and SDGs. The SDG Goal 6: Ensure availability and sustainable management of water and sanitation for all was linked with related WSIS Action Lines: C3 Access to Information, C4 Capacity Building, C7 ICT Applications e-Science, and C8 Cultural Diversity and Local Context.
4. Could you share case studies of regional/ international cooperation that have strengthened STI developing countries' capacities in managing water and sanitation and improve their access for all?
- a. ITU, other 11 UN entities and ITU-T [Study Group 20 on the Internet of things \(IoT\) and smart cities and communities \(SC&C\)](#) have recently launched a [Toolkit on Digital Transformation for People-Oriented Cities and Communities](#) which supports strategizing and planning the digital transformation of cities and communities to promote sustainable, inclusive, resilient and improved quality of life for residents in cities and communities. It highlights case studies of regional/international cooperation in strengthening STI globally in managing water and improving their access for all.