



Outcome report

Emerging terrestrial technology for connectivity

Wednesday 7 July 2021 (14:00 – 15:00 CEST)

Moderator: Regina Fleur Assoumou-Bessou, Chair of ITU-D Study Group 1, Director of International Cooperation, Telecommunication/ICT Regulatory Authority and Post Office of Côte d'Ivoire (ARTCI).

Speakers:

- Irwin Gerszberg, AT&T Fellow Distinguished Member of Technical Staff
- Rohit Jha, CEO and cofounder, Transcelestial Technologies
- Elizabeth Migwalla, Vice President International Government Affairs, Qualcomm
- Jyrki Penttinen, Senior Technology Manager at GSMA

Session summary: In this session, participants discussed different emerging terrestrial technology for connectivity and their requirements and implications for developing countries. Moreover, they discussed, technical requirements of emerging terrestrial technology; they presented best practices for maintaining/upgrading networks and infrastructure as well as the challenges and opportunities of emerging terrestrial technology in LDCS, LLDCS and SIDS.

1. Main outcomes highlighting the following:

- Announcement of the final ITU-D Study Group report on Question 4/1 Economic policies and methods of determining the costs of services related to national telecommunication/ICT networks, including next-generation network is available as from today. It includes insightful guidelines based on country case studies and lessons learnt from industry and academia work. A comprehensive Cost Modelling Guidelines document is also issued together with the final report. These reports can be downloaded and used by all free of charge and is complemented by a video clip on affordable connectivity. An invitation to join the next meeting of ITU-D Study Groups being held from 11 to 22 October 2021 and engage through submission of contributions and active discussions in the meetings, was made.
- Irwin Gerszberg presented the AirGig™. The presentation introduced a multi-Gigabit data transmission over existing power lines to subscribers. The AirGig™ technology works on any electric grid around the world to enable multi-gigabit 2-way smart grid supporting clean renewable energy sources and broadband to subscribers. It turns today's one-way electricity into 2-way electricity, wherever there is electricity, you can get high speed broadband.

- Elizabeth Migwalla noted that the webinar is taking place at a time when ITU-R has completed two key milestones that will help enable 5G adoption on a global scale. The first milestone is related to WRC-19 decisions to extend IMT identified spectrum to mmWave, meaning that operators can now access the required combination of low, mid and high band spectrum to exploit the full capabilities of 5G. The second milestone is related to the approval of the IMT2020 Specifications late 2020, through an ITU process that brings technology and innovations under an umbrella that is inclusive, relevant, accessible to all developed and developing nations. She emphasized that while IMT2020 technology has been developed by technology providers such as Qualcomm, what is needed is the creation of the enabling policies and regulations for network and service rollouts.
- Dr. Jyrki Penttinen presented the key aspects of the evolution and benefits of 5G, how it can serve LDCs, LLDCs, and SIDS, and how GSMA helps ecosystem form guidelines to complement technical standards, including roaming and interoperability aspects.

2. Main conclusions reached during the discussion:

- 5G outperforms the previous generations in terms of spectral efficiency, offered capacity and data speed, security, and many more attributes thanks to various technical advances and the opportunity to utilize extended spectrum. 5G changes the philosophy of the networks' architectural model and is capable of coping with different use cases optimizing network resources and user experiences. Thanks to especially network slicing, 5G also provides the ecosystem with completely new business opportunities while the consumers can start enjoying better quality of service. It is important to note, though, that the practical deployment takes place gradually; by 2025, the GSMA estimates that about 21 % of the mobile users can rely on 5G networks while 4G dominates still the global market. Equally important is to note that there will be still many areas where 2G and 3G serve as a feasible base, both from technical and economical perspectives, despite their declining use base.

3. Panellists contributions to the outcome reports:

- *What are the opportunities and challenges of emerging technology for LDCs, LLDCs and SIDS*
 - LDCs, LLDCs and SIDS often represent challenging environments, as an example, the deployment of the very latest technologies is not often practical due to the hard-to-access physical areas and limited economics of the countries. The modern communication technologies can be challenging to deploy (in some LDCs), but at the same time, due to the lack of prior infrastructure, it is even more fluent to jump directly to the latest generation without the need to support often complex combination of legacy solutions. If only the devices and services are affordable adapting to the regional economies, evolving mobile communication technologies such as 5G can provide technically feasible solutions even in the densest rural areas and islands via

satellite component, integrated wireless backbone and other features that help overcome the roll-out challenges.

- Whether it is a developing country, a developed or LDCs, LLDCs, and SIDS, it will take all stakeholders to work together to bring connectivity to citizens. However, there's work to be done as partners and stakeholders to create an enabling environment that enable countries to adopt these technologies.
- *What are the most important points/aspects of the emerging technology that should be considered in order to accelerate the digital transformation in LDCs, LLDCs and SIDS?*
- As many developed countries transition towards the latest systems, the fluent continuum of existing services needs to be ensured. Especially the functioning of the voice service interconnection and roaming needs to be designed in such a way that they work correctly along with increasing number of operators proceeding with the 2G and 3G rationalization, that is, the legacy network sun-setting and re-farming their capacity to the more spectral-efficient 4G and 5G networks.
- *In what way and usages could space emerging technology help accelerate the digital transformation of LDCs, LLDCs and SIDS?*
- Space technologies, including the related evolution of 5G to include new access types beyond terrestrial component, will provide technical specifications related to aerial vehicles and satellites. These technologies can help cover underserved areas taken that the cost of respective devices and subscriptions can be set to adequate level. This can be beneficial to overcome digital divide, and to provide more reliable emergency communications channels for, e.g., important messaging before, during, and after natural disasters.
- *What is your vision on smart cities in the next 20 years and why?*
- The LTE will dominate global markets during the first half of the 2020s whereas 2G and 3G user base is declining. The 5G user base growth is steady, but the global deployments would not happen overnight. 5G outperforms the previous generations, and there will be even more performant 6G becoming reality in 2030s, but regardless, there may still exist operational 2G and 3G networks in special environments serving, e.g., remote IoT devices for agriculture for years come. Reflecting how fast the evolution has been with many scientific and technical success stories breaking the previous performance records, it is obviously rather challenging, if not impossible to estimate the environment in 2040s. Based on the established cycle of completely new generation per each new decade, we could present educated guess about yet another generation starting to materialize after 20 years from now, whether it is called 7G or simply a phased continuum of the Beyond 5G, or B5G, systems – that outperforms the 6G as defined by the respective, forthcoming next IMT of the ITU. All these technical platforms, current and future ones, can help expedite the development of the smart cities. 5G alone

can already tackle many of the requirements of the smart cities such as massive sensor communications that can optimize city logistics and functions, and future networks complement the ecosystem. Combined with the advances of AI/ML, the intelligent sensor networks start forming the next level of Ambient intelligence. This development paves the way for increasingly efficient and safe environment for the citizens.