

**Seventh SG13 Regional Workshop on  
“Standardization of Future Networks towards  
Building a Better Connected Africa”**



**Abuja, Nigeria, 3-4 February 2020**



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**How is Africa adjusting to the  
emergence of 5G technology**

BY

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# Introduction

- IMT-2020 (5G) is future IMT systems that should support the enhanced mobile broadband (eMBB) use case, an emerging use cases with a variety of applications such as massive machine-type communications (mMTC) and ultra-reliable and low latency communications (URLLC). A dream to have reliable services anytime everywhere at any unit with stable quality independent of the access that is coming true. (5G Basics ITU-T PUBLICATION (2017))
- IMT-2020[ITU-R M.2083-0]: are systems, system components, and related aspects that support to provide far more enhanced capabilities than those described in Recommendation ITU-R M.1645.

# OBJECTIVE FOR THE DEVELOPMENT OF IMT -2020

- The objective for the development of IMT-2020 is to address the anticipated needs of users of mobile services in the years 2020 and beyond.
- Again, the vision and service scenarios of IMT-2020 which is to Enhanced Mobile Broadband, ultra-reliable and low latency communications, massive machine type communications are being identified by related SDOs (ITU-T, ITU-R, 3GPP, NGMN, etc.)
- Meanwhile, ITU-T SG13Q20 focuses on the study of the requirements, capabilities, architecture and key technologies to realize the IMT-2020 network. Its work on the ecosystem from business models and use cases is promoted to build and realize the better cooperation with mobile customers.
- Also is the work of other ITU-SGs in the area of future networks, NGN, cloud computing, trust, big data, SDN and so on, that are related to development of 5G network



# What are the anticipations surrounding 5G

- New demands, such as more traffic volume, many more devices with large gamma of service requirements, better quality of user experience (QoE) and better affordability by further reducing costs, will require an increasing number of innovative solutions.
- Billions of people and devices in 5G networks will communicate at a speed of 1 Gbit/s and Technology allowing this should be in place by 2020. **Are we there now.**
- The new generation of the mobile communication changes roughly each 10 years.



# Why 4G systems are not good enough

The answer comes from the ITU-R 5G vision document that the exponential growth of the need for communication over the wireless devices by the end of 2020 will require the high reaction of the system (ideally with the delay less than one millisecond) and ultra-broadband connectivity of mass mobile devices with increased flexibility end-to-end, mobility of users while accessing a service, energy efficiency and system reliability.

Hence the difference from the previous generation of mobile communication is a very rapid response of the system that allows multiple applications to provide services almost immediately.





# Present works on 5G

A lot of work is ongoing towards the development of 5G.

- ITU
  - SG13 – Based on the recommendations of the FGIMT2020
  - FGML5G
- 3GPP
- IEEE
- ETC

# The position of FGML5G on development of IMT 2020

- Noting that 5G network technology is an innovative technology based on a common infrastructure, with flexibility, low-cost, differentiated, customized, and isolated end-to-end networking capabilities to meet the vertical industry's differentiation, FGML5G have developed an adopted resolutions by ITU-T, [ITU Y.3172, standard](#) - an architectural framework for networks to accommodate current as well as future use cases of Machine Learning and made other contributions of interest on slicing, use cases, projects for students, etc
- However, participation by developing countries are yet to be pronounced in the development of IMT 2020, and neither are there deliberate attempts to induce contributions from these developing countries considering large availability of legacy networks, 2G, 3G, and 4G networks in these areas.
- What will be the future position of legacy networks, 2G, 3G, and 4G networks in these area as 5G emerges.
- It is expected that migration strategies have to evolve in terms of migration to 5G from these networks.



# Radio frequencies under consideration for 5G

- High-capacity 5G radio frequencies under consideration will be essential to deliver world-leading 5G services
- to realise the full potential of 5G networks would call for around 1 GHz of contiguous spectrum per operator in the mmWave bands for initial 5G roll-outs.
- Some of these frequencies include 26 GHz, 40 GHz and also 66-71 GHz bands amongst others.
- Due to the large amount of spectrum needed for 5G services, the range 45.5-52.6 GHz is also considered amongst others.



# Radio frequencies under consideration for 5G

## Fall out of WRC- 19:

New Resolutions approved at WRC-19 pointed out that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that had previously been identified for use by administrations wishing to implement IMT. They also pointed that harmonized worldwide bands for IMT are desirable in order to facilitate global roaming and the benefits of economies of scale

# Radio frequencies under consideration for 5G

## Additional bands identified to enable 5G deployment:

- While identifying the frequency bands 24.25-27.5 GHz, 37-43.5 GHz, 45.5-47 GHz, 47.2-48.2 and 66-71 GHz for the deployment of 5G networks, WRC-19 also took measures to ensure an appropriate protection of the Earth Exploration Satellite Services, including meteorological and other passive services in adjacent bands.
- In total, 17.25 GHz of spectrum has been identified for IMT by the WRC-19 Conference, in comparison with 1.9 GHz of bandwidth available before WRC-19. Out of this number, 14.75 GHz of spectrum has been harmonized worldwide, reaching 85% of global harmonization.

# Radio frequencies under consideration for 5G

**WRC 2023 Agenda Items for WP 5D** the lead group to consider further frequencies for IMT systems

Agenda Item 1.1: This agenda item considers identification of frequency bands 3 300 - 3 400 MHz (Region 2 and amend footnote in Region 1), 3 600 - 3 800 MHz (Region 2), 6 425 - 7 025 MHz (Region 1), 7 025 - 7 125 MHz (globally) and 10.0 - 10.5 GHz (Region 2) for IMT including possible allocations to the mobile service on a primary basis.

Agenda Item 1.2: This agenda item considers use of high altitude platform stations as IMT base stations (HIBS) in the mobile service in some bands below 2.7 GHz. In particular, the bands:

- 694 - 960 MHz
- 1 710 - 1 885 MHz (1 710 - 1 815 MHz for uplink only in Region 3)
- 2 500 - 2 690 MHz (2 500 - 2 535 MHz for uplink only in Region 3 except 2 655 - 2 690 MHz in Region 3)

Agenda Item 1.4: spectrum needs for HIBS



# Use case scenarios of 5G

- The basic Use case and Migration scenarios to 5G are yet to emerge fully to enable clear approach towards policy formulation, regulation and legal instruments for IMT-2020 deployment for its conduct in most countries.
- However, some countries, equipment manufacturers, operators amongst others are already test running the 5G services.
- Work of the FGML5G has revealed aspects of use cases evolving from IMT 2020 services.
- Considering that Technology is not regulated, the question that arise hinges on if operators should leverage on the already existing operating license and use their current network resources to operate the 5G services, or a new license regime provided afresh for operation of 5G services
- What radiation impact will deployment of 5G services create. (WTSA Res. 72, WTDC Res. 62, ITU-R Q1/23)



# Revelation on use of 5G

- “The impact of 5G within the continent (Africa) may not be felt near-term but will be significant over the next decade and a half. By 2025, there will be commercial 5G services in at least seven markets, including Kenya, Nigeria and South Africa, with 28 million 5G connections (equivalent to 3% of total mobile connections) between them.
- The role that mmWaves play across the region is impressive, supporting over a third of those 5G connections by 2034.

Across Sub Saharan Africa, over a 15-year period, from 2020 to 2034, access to this resource is expected to power a \$5.2 billion boost in the region’s GDP and nearly \$1 billion in tax revenue which will come from mmWave 5G services.”

- - Culled from GSMA ATU Newsletter update on **ATU – APM19-4: 26 - 30 August 2019, East London, South Africa**





# Revelation on use of 5G

- Over the past 30+ years, the mobile community has built a phenomenal global social and economic success story. Deployment of 5G mobile technology extend its utility as Internet protocol-based mobile communications and will become the bedrock of mobile standards; and the release of new spectrum satisfies the growing service demands of both business and consumers.
- Global mobile Suppliers Association (GSA) fully expects that, with the right industry focus, 5G technology will be deployed faster than previous technology generations. This is already happening with infrastructure, chip and device manufacturers accelerating the availability of 5G software and hardware, while also making economic strides in reducing the costs of deployment and management of 5G technology.
- Therefore, Government support for 5G trials and early deployments in both developed and developing countries is also essential.”
- - Joe Barrett, President, Global mobile Suppliers Association (GSA) [ITU News Magazine 2019]



# ITU Resolutions on developing countries participation in evolution of new technologies

- Resolution 44 WTSA-16,
- Resolution 54 (Rev. Hammamet, 2016)
- Resolution 32 (Rev. Hammamet, 2016),
- Resolution 123 (Rev. Dubai, 2018),
- Resolution 71 (Rev. Dubai, 2018),
- Resolution 47 (Rev. Buenos Aires, 2017),
- Resolution 37 (Rev. Buenos Aires, 2017), amongst others



# Strategic direction to be taken by ITU-T

- The ITU-T procedures and mechanisms, internal and external coordination and collaboration, and stakeholder participation in the evolution of 5G should continue as 5G is realisable.
- More participation, particularly in the area of creation of awareness of the 5G technology amongst all the continents should continue.
- Deliberate attempts should be created to involve participation and contributions from developing countries.
- Clear approach towards policy formulation, regulation and legal instruments for IMT-2020 deployment for its conduct in most countries has to be clearly defined.
- The issue of frequency availability for 5G deployment has to be seen through global concern and pursued as a matter of urgent need.
- What radiation impact will result from 5G deployment

# TAKEAWAY

- How many countries have approved spectrum for the trial of 5G services, particularly in developing countries
- What are the indices to determine implementation policies, projects and programmes aimed at facilitating digital revolution and inclusion in developing countries
- should operators leverage on the already existing operating license and use their current network resources to operate the 5G services, or a new license regime provided afresh for operation of 5G services
- How is the view of GSMA and GSA on the economic implication of 5G corroborated by any other body, SDO or ITU.
- **Can the FGML5G or any other FG hold one of its meetings in Africa.**
- What is the status of 5G service radiation content

# THANKS FOR YOUR KIND ATTENTION

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