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GSMA Proposal on 6G

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3GPP Stage 1 Workshop on IMT2030 Use Cases

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GSMA Proposal on 6G for the SA1 Workshop

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Basis of Approach

Proposal: high-level principles for 6G from the GSMA prospective

- The objectives that 6G standardisation needs to meet should be firmly established. This should include objectives that directly serve the stakeholder groups and also serve indirect stakeholder groups. Examples being:

DIRECT

Faster eMBB, user density, operator handover times, support for lowest possible UE power consumption for IoT

INDIRECT

6G core as harmonized integration point for non-3GPP networks, reduced operational requirement in support of population reductions, support for other environmental points – sustainable human/power usage, circular economy

- It is clear that we are not yet in a position to elaborate these as objectives that all SDOs are able to work from.
  - GSMA would work with 3GPP to elaborate this further and find objectives that meet this criteria.

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GSMA Proposal on 6G R&D

Proposal: high-level principles for 6G from the GSMA prospective

- Consider the business need of all stakeholders and work on services/features that have a clear business case and are forecasted to be deployed.
- Make sure that both public (consumer) and private (enterprise) usage are included and balanced. It should be noted that the majority of customers for mobile operators are consumers.
- Include features to address higher level societal issues:
  - Population changes (either increasing or declining depending on countries)
  - Reducing pool of operational staff
  - Sustainability: not limited to energy consumption, but looking at also at circular economy and other factors
- 6G should have a full featured voice solution, in particular to cover roaming, lawful interception and emergency calling use cases. Roaming should be commercially viable from the start (reminder of 5G issue) (Note this can still be VoNR)
  - This is also extended to any service that is driven by national regulations.

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GSMA Proposal on 6G R&D

- Take in account the decision and work that resulted from WRC-23
- Inherent security, resilience, and automation will be critical.
  - Expectation on readiness to provide quantum resilient security, including inherent support for crypto-agility
  - As critical national infrastructure, the autonomy of the network should also be a key consideration
  - Address security vulnerabilities from previous generations
- Sustainability aspects are of upmost importance and any features added should consider and demonstrably provide their impact on the sustainability.
- Each release should provide a fully functional service, even if that will impact either the length of the release or the content.
- Support for extended, mature and well understood supply chains – clear relationship between bodies such as 3GPP, deployment organisations O-RAN, C-RAN, GSMA
- Take in consideration explicit lessons from 5G/5G-Advanced deployments

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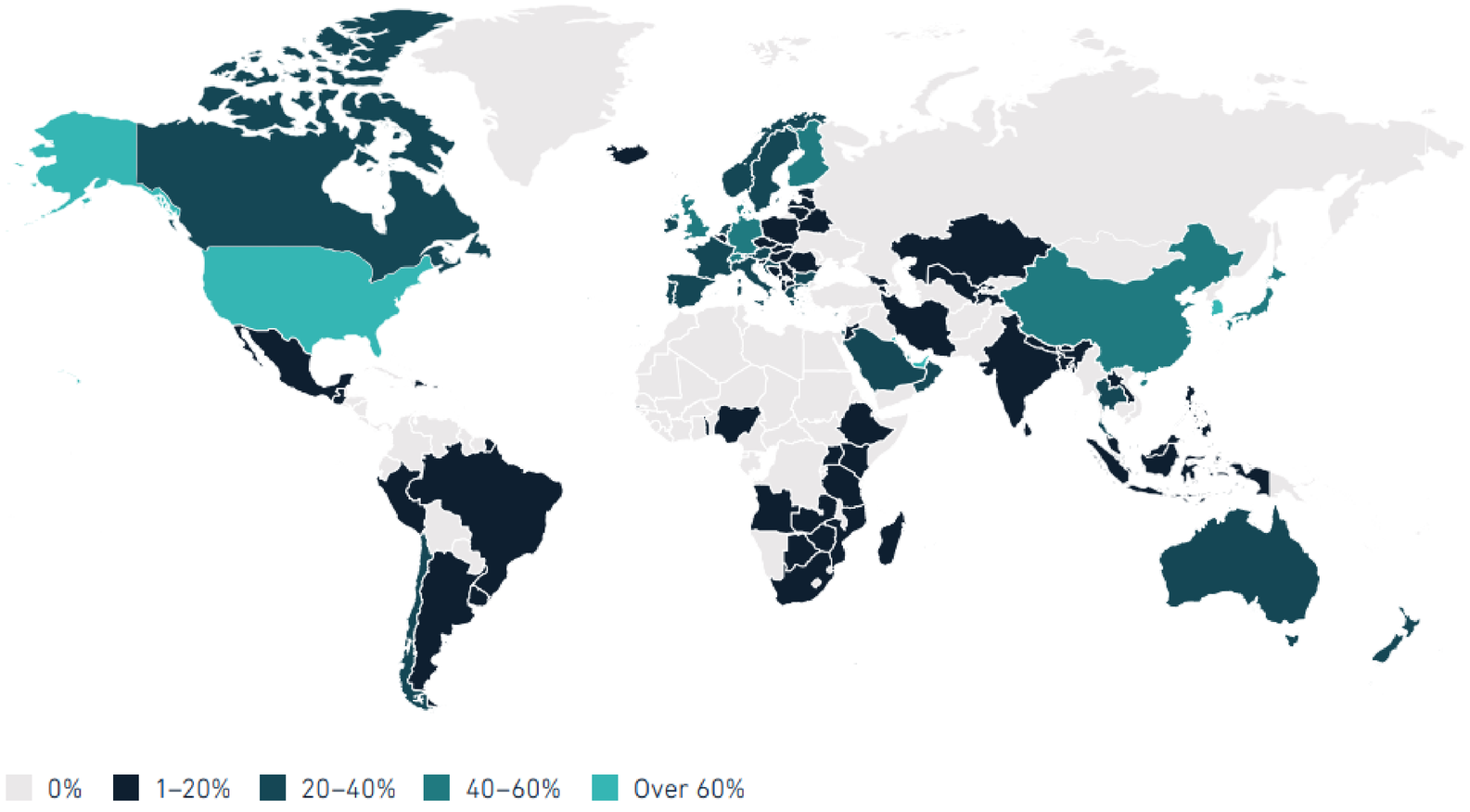
Current 5G status

5G market penetration globally, 2023



Source: GSMA Intelligence

As of January 2024:

- **261 operators**
- in **101 countries**

globally had launched commercial 5G mobile services.

- **Only 47 operators** offered commercial 5G services on SA networks

There were 1.7 billion 5G connections at Q1 2024 and about 16 million 5G connections for FWA.

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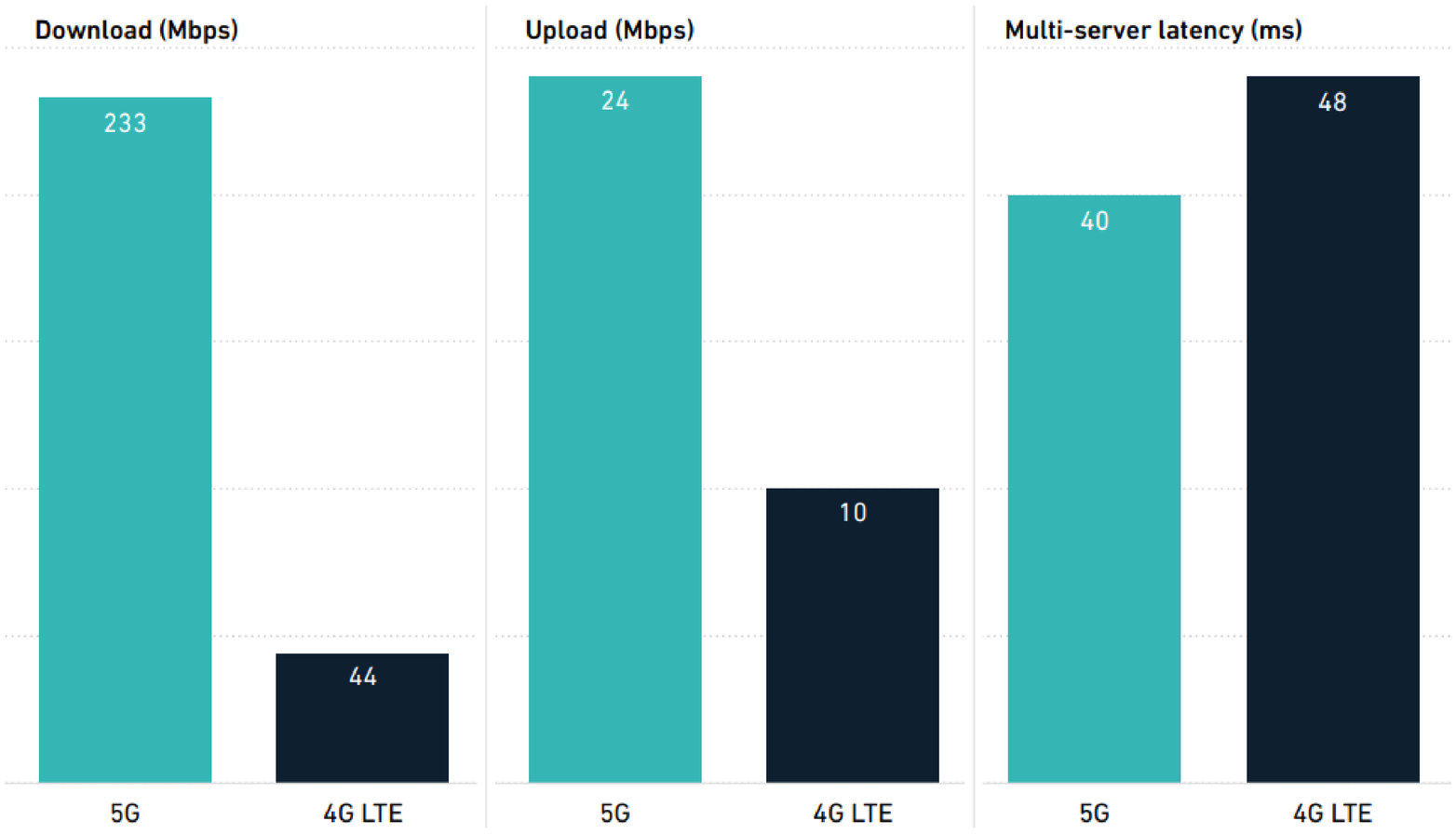
Current 5G status

Too early to provide detailed experiences of 5G and 5G-Advanced.

- eMBB is the primary deployment globally
- Only few commercial use of Network slices (primarily temporary)
- Too early to look at URLLC and 5G-Advanced

Average download speeds, upload speeds and latency for 4G and 5G, Q4 2023



Note: Data is based on the 39 markets in the 5GI.
Source: GSMA Intelligence analysis of data provided by Ookla Speedtest Intelligence

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Sustainability: status today

- For the networks typically 65-85% energy use come from its operational energy use
- For mobile devices, ~80% of the life cycle impacts come from materials and manufacturing, and less than 20% from energy to charge/power devices.
- Mobile networks account for around two-thirds of overall network energy use, and has grown in recent years. Between 2015 and 2020, global mobile network energy use increased by 18%.
- Energy costs typically account for 20-40% of network operating costs
- Refurbishing network equipment emits about 90% less carbon than manufacturing new equipment.

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High level suggested sustainability outcome

Energy Consideration

- Globally, mobile network energy use should consider remaining within an ‘energy budget’ thereby remaining flat or decreasing over time.
- Cross-industry energy metrics should be agreed to provide transparency on energy usage and to help support energy reduction
- Energy use per subscriber should as a minimum remain flat or ideally decrease over time
- Mobile networks should be designed to be as ‘energy proportional’ as possible. In other words, during periods of low utilisation, it should use near-zero energy. As connections, activity, and traffic increase, energy use should scale proportionally.
- Energy efficiency sleep modes should be enabled by default.
- Tools (like AI) should be used to help support improving environmental performance in the design, manufacturing, operations and end-of-life of equipment

Circularity Consideration

- New network equipment should embed circularity principles in its design to reduce its embodied environmental footprint
- Key circularity principles cover:
  - Modularity to enable replacement and upgrade key components
  - Repairability to facilitate easier repair and refurbishment
  - Recyclability to consider how the components and materials within the equipment can be more easily recycled at end-of-life
  - Use of recycled materials to avoid virgin material use and its associated environmental impacts
  - Use of renewable energy in the material and manufacturing supply chain

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GSMA Wrap-Up

- **5G HAS A LONG WAY TO GO** – GSMA looking to actively contribute as MRP
- **MOBILIE INNOVIATION IS CONTINUOUS** - The mobile industry continues to engineer new, world-changing industrial capabilities - SDN, Virtualisation, Compute Containerisation, etc. The future alignment of such capabilities is an important part of how future standards are engineered.

OBJECTIVES

- More work is still needed to have a better understanding of the requirements.
- GSMA will try to further work on sustainability, security and resilience.
- GSMA will regularly share feedback from real deployments experiences.

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GSMA framework on timing of 6G Deployment

- **Background** - Early signs of 6G ‘bandwagon’ showing up in media, raising expectations and pressure on investment, long before all 5G releases have shown their potential.
- **Give Mobile Generations time to mature** - Each generation faces a multi-year journey from deployment to investment returns; even after specifications and spectrum are sorted.
- **5G has a long way to go** - Five years since first 5G deployments, many operators have not deployed 5G at all. Beyond enhanced mobile broadband, new attributes of 5G, are in 5G Standalone. Only 47 operators have deployed 5G SA, concentrated in 19 countries.
- **Mobile innovation is continuous** - The mobile industry continues to engineer new, world-changing capabilities - broadband, IoT, low-latency applications, network slicing, network virtualisation, industrial private networks, etc. Mobile’s value to global enterprises depends on global standards and interoperability. 5G is the most inclusive of the 3GPP generations, and we want to ensure that trend does not reverse.

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THANK YOU!

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