

“Key Issues for the Satellite Industry @ WRC-23 Agenda”

12 November 2020

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- **Agenda Item 1.2: IMT in 3/6/7/10 GHz - Res. 245 (WRC-19)**
- **Agenda Item 1.3: Mobile Service in 3600-3800 MHz in Region 1 - Res. 246 (WRC-19)**
- Issue 9.1 c): IMT in bands of the Fixed Service (FS) - Res. 175 (WRC-19)
- Article RR21.5: Applicability of RR21.5 to IMT stations (WRC-19 doc. 550)

Agenda Item 1.2: *to consider identification of the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 245 (WRC-19);*

Responsible Group: Working Party 5D

Contributing Group for FSS: Working Party 4A

Resolution 245 (WRC-19) calls for studies for the terrestrial component of IMT in the bands:

- 3 300-3 400 MHz and 3 600-3 800 MHz (Region 2);
- 3 300-3 400 MHz (amend footnote in Region 1);
- 6 425-7 025 MHz (Region 1);
- 7 025-7 125 MHz (globally);
- 10 000-10 500 MHz (Region 2).

ESOA position on the band 6425-7125 MHz:

Considering that many countries rely heavily on C-band satellite services offering vital services which in many cases cannot be reliably provided or provided at all by other means, and that existing studies between FSS and IMT have demonstrated that sharing is not feasible: in the bands 6 425-7 025 MHz in Region 1 and 7 025-7 075 MHz globally.

Background:

C-band downlink

Existing studies between IMT and FSS in the band 3 600-3 800 MHz 6425 MHz and studies to be done under AI1.2.

	IMT-Advanced (4G)	IMT-2020 (5G)
ITU	Report ITU-R S.2368	To be done under AI1.2
CEPT	ECC Report 100	ECC Reports 254 and 281

C-band uplink

Existing studies between IMT and FSS in the band 5925- and studies to be done under AI1.2:

	IMT-Advanced (4G)	IMT-2020 (5G)	WIFI in 6 GHz
ITU	Report ITU-R S.2367	To be done under AI1.2	No studies
CEPT	No studies	No studies	ECC Report 302

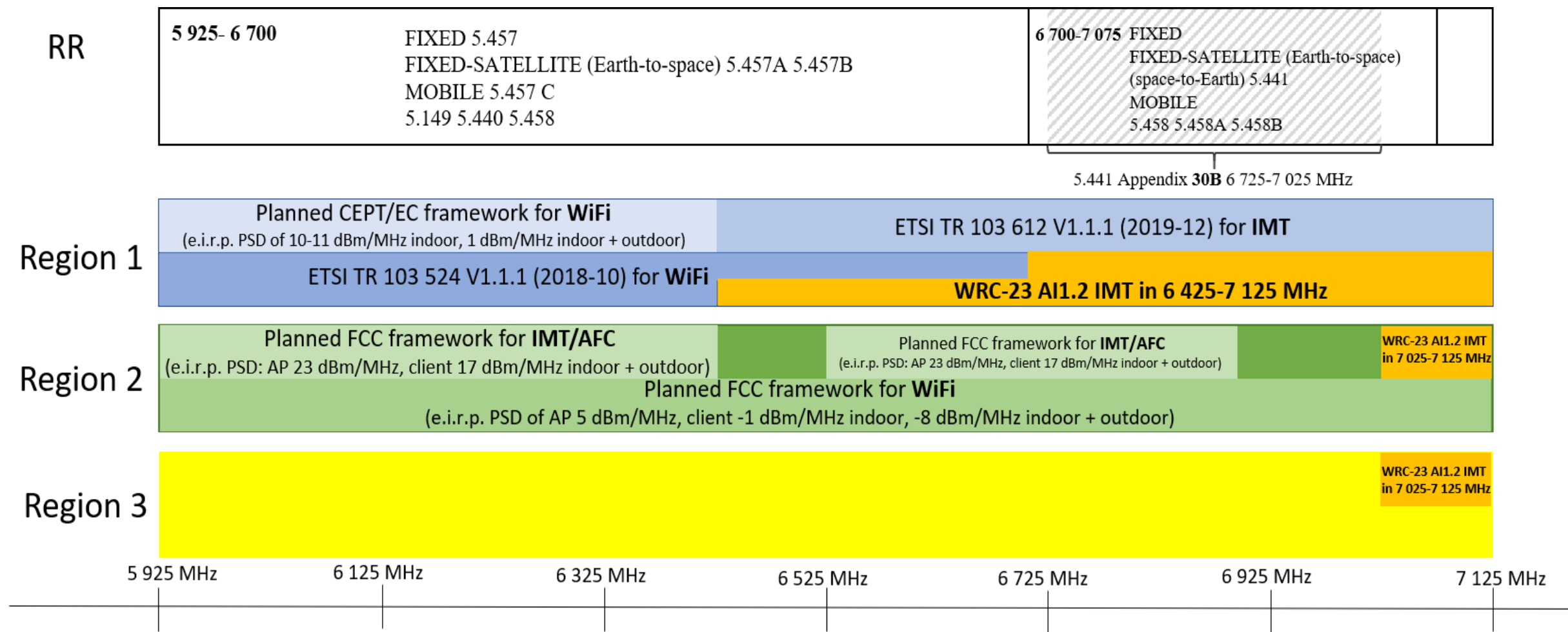
In the range 6425-7125 MHz, one should differentiate the following sub-bands:

- 6425-6725 MHz: this band is allocated to the FSS globally (earth-to-space) and is not subject to a Plan. The band is used for uplinks by large numbers of GSO FSS networks covering all Regions. Use includes feeder links for MSS systems.
- 6725-7025 MHz: this band is subject to the FSS plan (AP30B), there are no existing studies with IMT/5G.
- 6 700-7 025 MHz: this band is allocated to the FSS globally (space-to-earth), limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. **9.11A**.
- 7025-7075 MHz: this band is allocated to the FSS globally (earth-to-space) and is not subject to a Plan.
- 7075-7125 MHz: there is no FSS allocation, so no direct impact.

Existing studies related to IMT-Advanced (Report ITU-R S.2367) show very little potential for IMT operations while protecting FSS uplinks (indoor use only, EIRP limit necessary).

Studies conducted so far at CEPT level have demonstrated that sharing with unlicensed WiFi indoor could be more feasible than IMT.

Background (cont'd):



Agenda Item 1.3 *to consider primary allocation of the band 3 600-3 800 MHz to mobile service within Region 1 and take appropriate regulatory actions, in accordance with Resolution 246 (WRC-19)*

Responsible Group: Working Party 5A

Contributing Group for FSS: Working Party 4A

Resolution 246 (WRC-19)

Resolves to invite ITU-R

“to conduct sharing and compatibility studies in time for WRC-23 between the mobile service and other services allocated on a primary basis within the frequency band 3 600-3 800 MHz and adjacent bands in Region 1, as appropriate, to ensure protection of those services to which the frequency band is allocated on a primary basis, and not impose undue constraints on the existing services and their future development,”

Resolves to invite WRC-23

“based on the results of studies in resolves to invite ITU-R, to consider possible upgrade of the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1, and to take appropriate regulatory actions,”

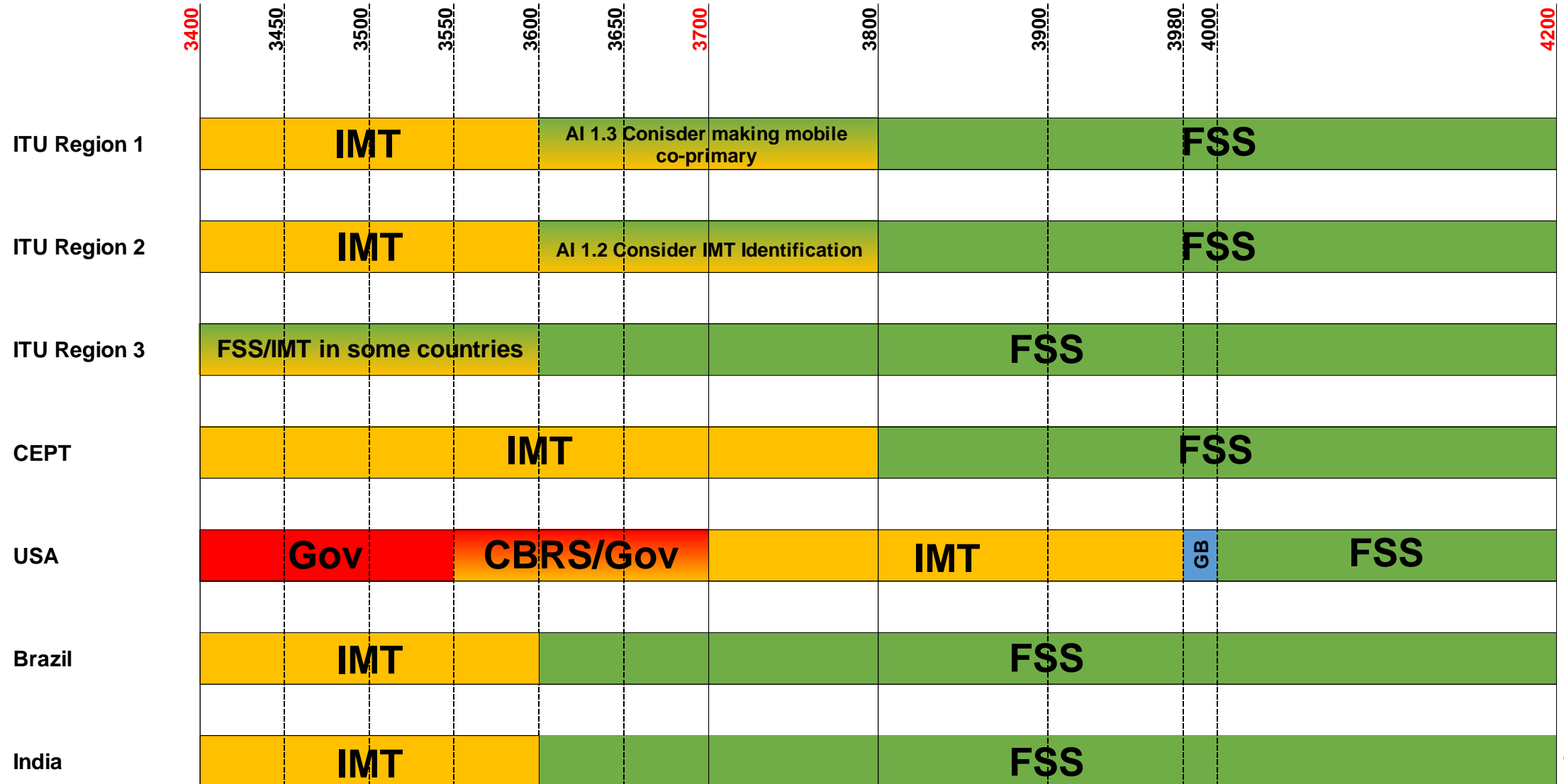
Background

- Based on the results made satellite operators, in order for any FSS earth station to co-exist with IMT 2020 (5G) base station, a separation distance of at least +70 km is needed
- These results are based on interference caused by a single 5G BS and impact of other services or the full 5G deployment have not been considered. In reality, the required separation distance would be even much larger.
- Due to sensitivity of FSS receivers resulting in large separation distances, a regulatory framework is required to protect Earth stations in areas close to borders from potential interference arising from 5G deployment in neighboring countries.

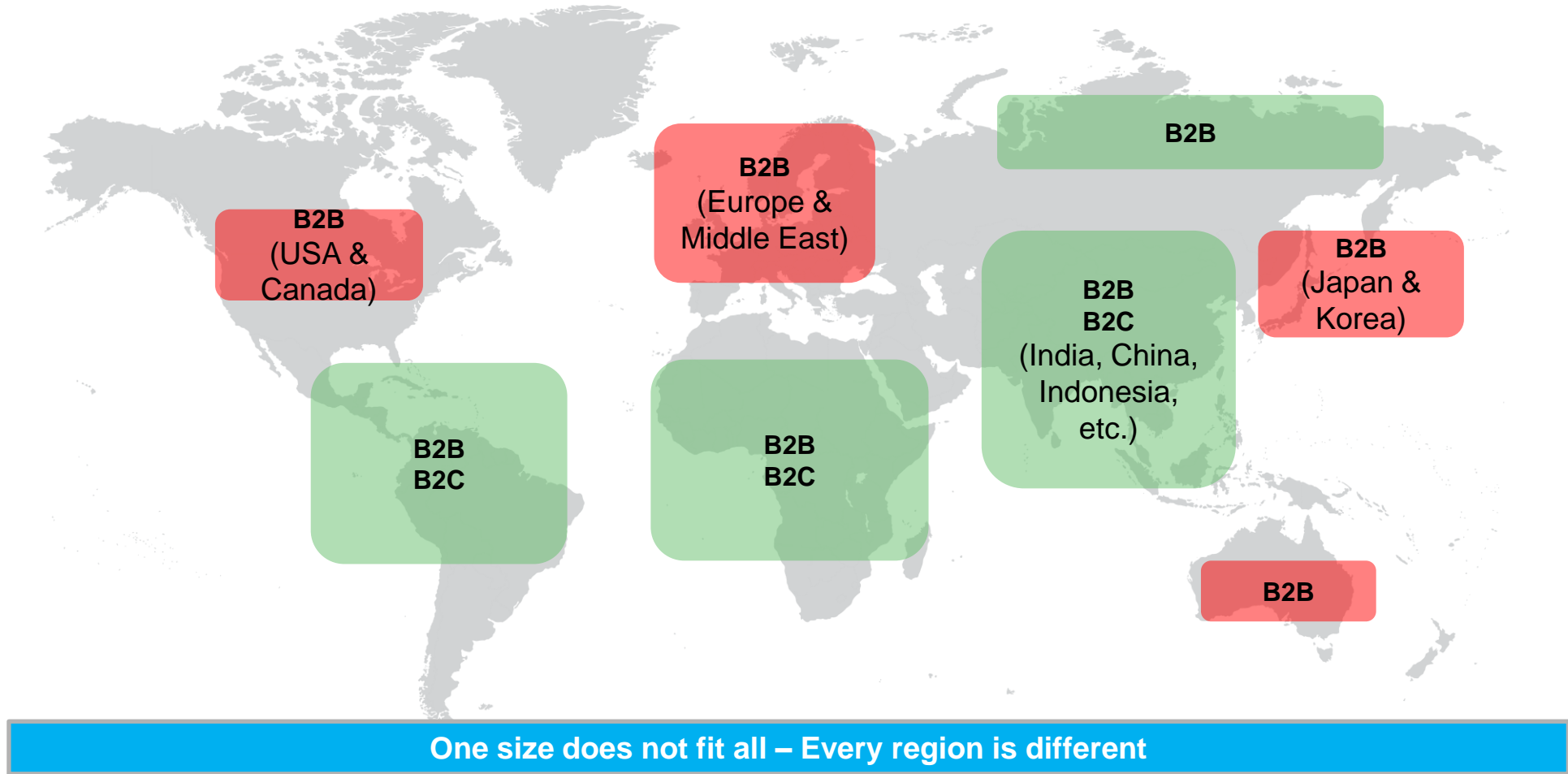
ESOA position:

Considering that many countries rely heavily on C-band satellite services offering vital services which in many cases cannot be reliably provided, or provided at all, by other means, and that existing studies between FSS and IMT have demonstrated that sharing is not feasible in the same geographical area.

C-band allocations post WRC-19



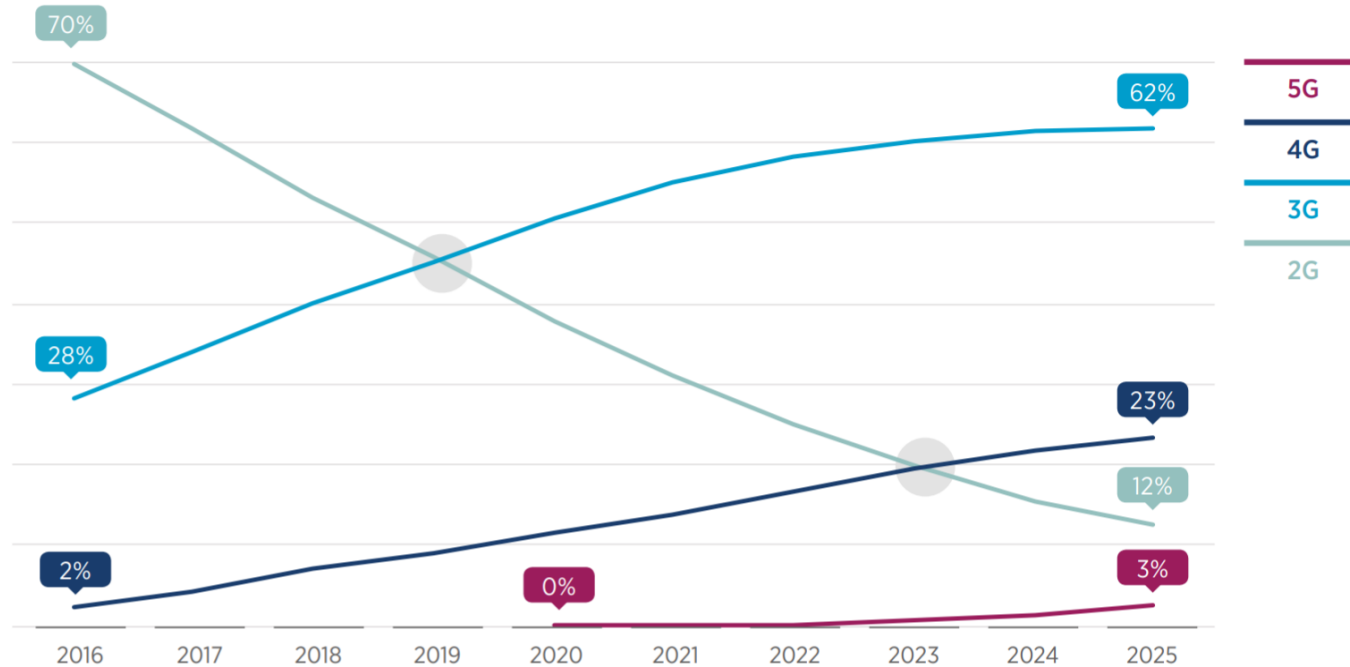
How FSS C-band is used around the world



2G / 3G dominate the scene in SSA

3G takes the lead in 2019; 4G overtakes 2G by 2023

Percentage of connections (excluding licensed cellular IoT)



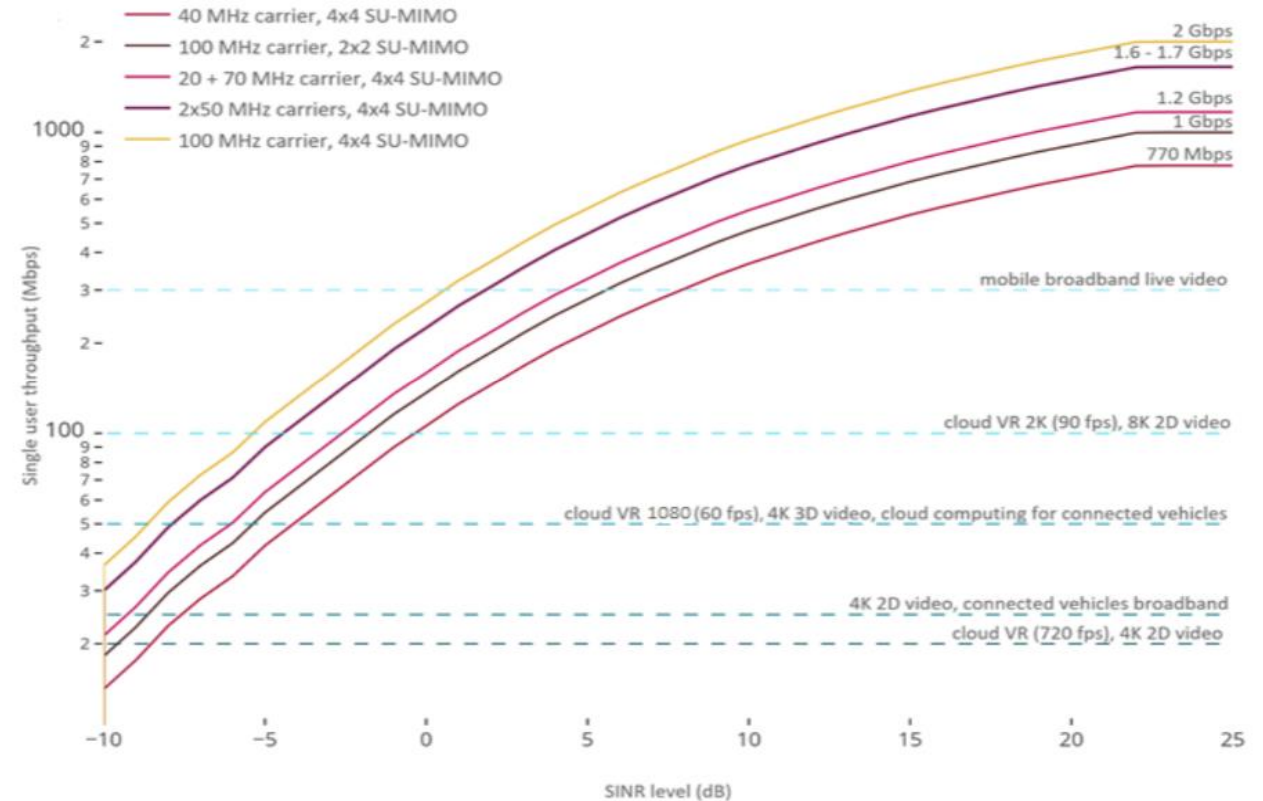
Source: The Mobile Economy: Sub-saharan Africa, GSMA 2018

- **2G / 3G** will still account for **85% of all connection** in SSA (by 2025)
- Over **800 million** people in SSA don't use mobile broadband:
 - Coverage
 - Affordability
- *Meanwhile, **satellite** remains a key enabler for coverage and connectivity in SSA*

3400-3600 MHz is the right amount of spectrum for 5G now in SSA

- Most countries have typically 3 to 4 national MNOs so making 200 to 300 MHz available should allow every MNO to have 60 to 100 MHz
- Majority of benefits to the economy and consumers will be realized through MNOs each deploying the first 40 MHz of C-band spectrum
- In response to claims by some MNOs that they needed access to at least 80 MHz of contiguous spectrum, Ofcom researched the ability of mobile operators to launch 5G services with 40 MHz of spectrum. It found that:

“(...) there was no evidence that 5G could not be delivered with smaller [e.g. 40 MHz blocks] or non-contiguous carriers in other frequency bands [i.e. spectrum other than C-band].”



Downlink Single User Throughput (SUT) across Different Signal Strengths in a Cell Compared with the Minimum Data Rate Requirements for some 5G Services*

80 to 100 MHz per MNO is a MYTH

See, Ofcom, §A7.39, Award of the 700 MHz and 3.6-3.8 GHz spectrum bands: Annexes (13 March 2020), available online at https://www.ofcom.org.uk/__data/assets/pdf_file/0017/192410/annexes-award-700mhz-3.6-3.8ghz-spectrum.pdf

Thank you Questions

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