Agenda Item 1.2, WRC-23

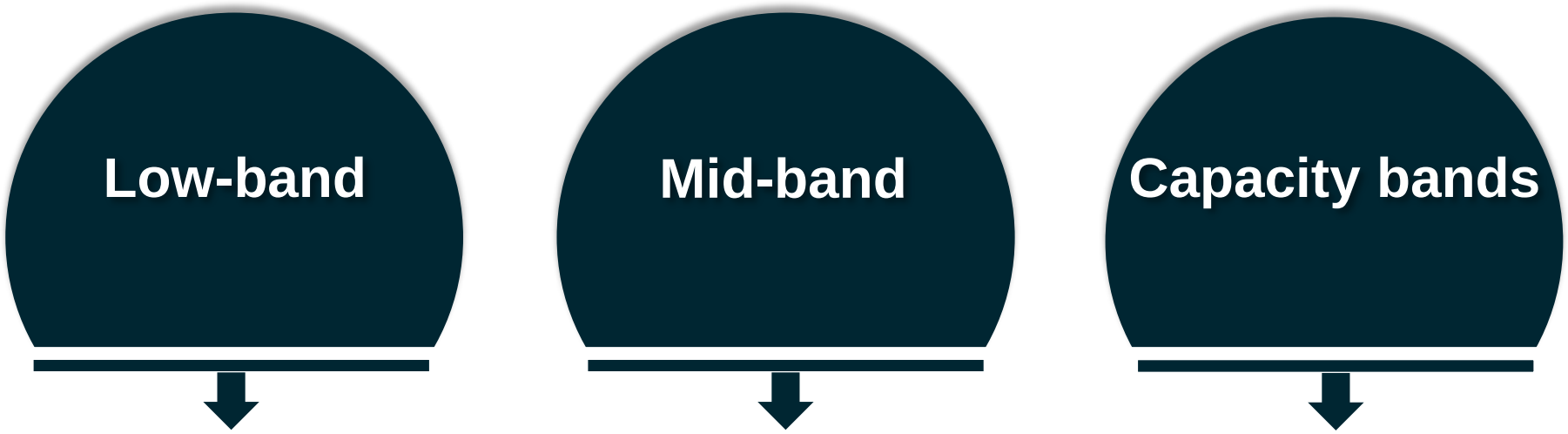
CTU Meeting , Montego Bay , February 2023

February 2023

Veena Rawat

WRC-23: Spectrum Needs of 5G

Harmonising for cost efficiency and coverage

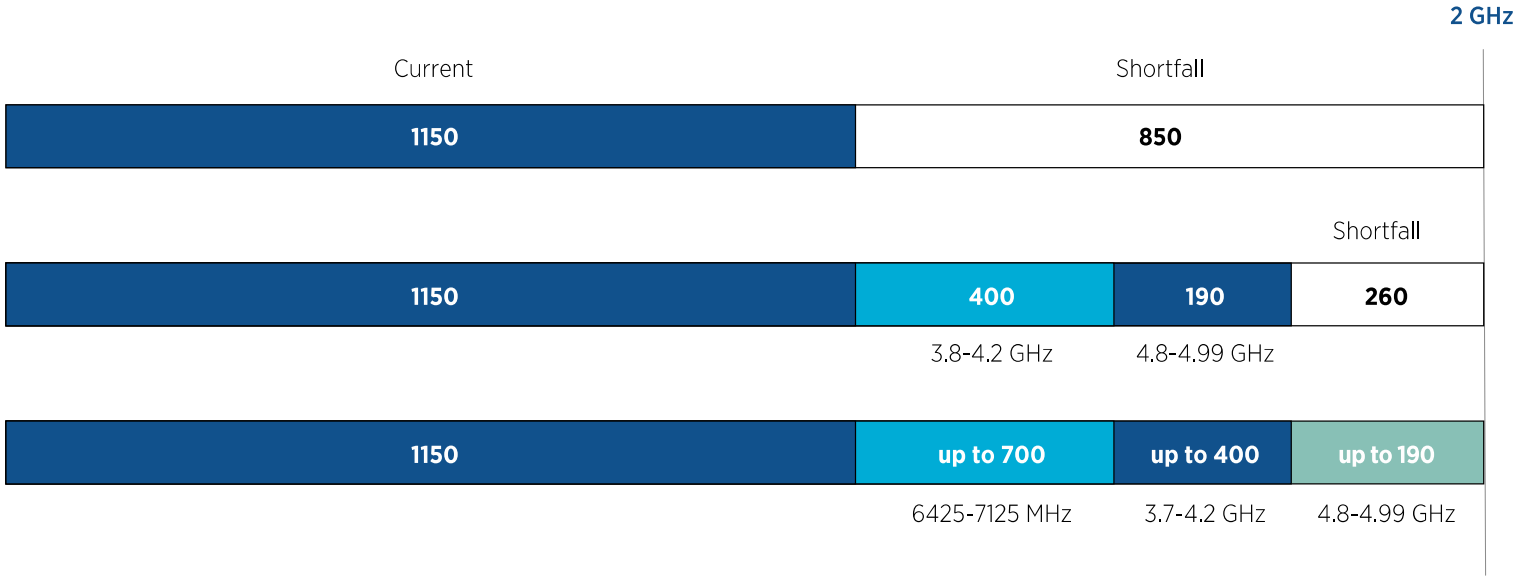


Agenda Item 1.5 considers 470-960 MHz

3300-3800 MHz
4800-4990 MHz
6425-7125 MHz

10-10.5 GHz can add to existing mmWave capacity

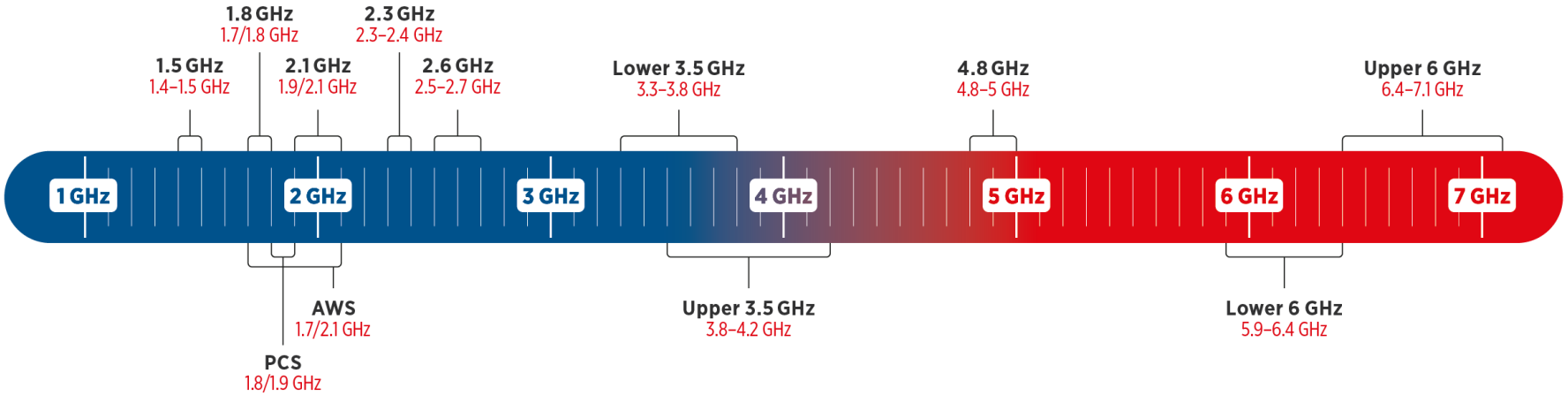
Mid-Band Options



2 GHz

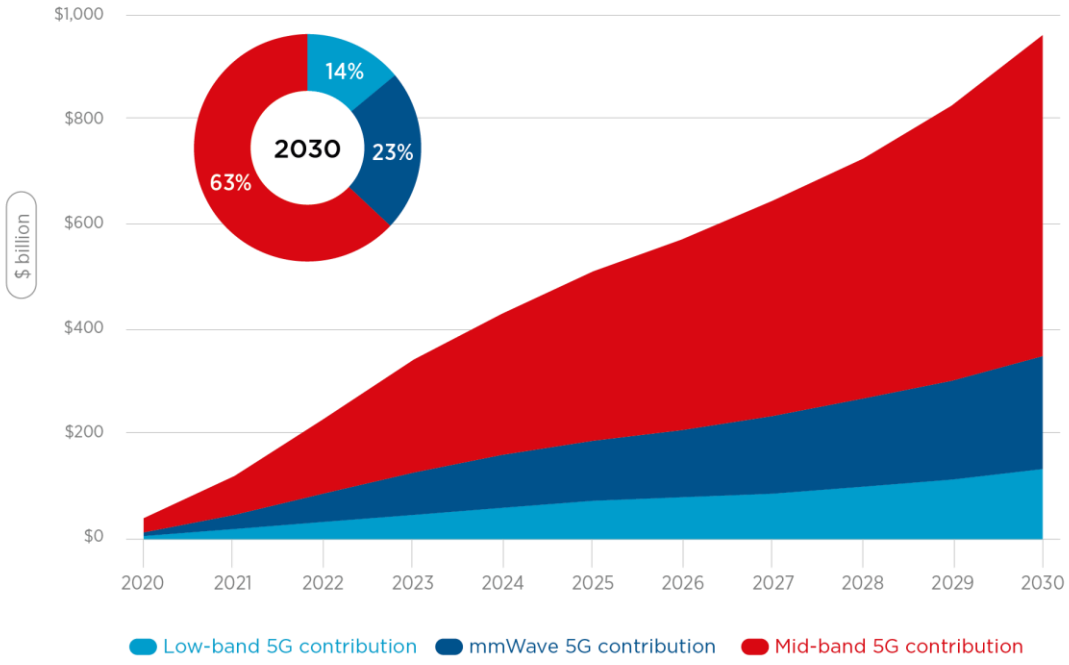
of mid-band is required for 5G by 2030.

This is challenging to achieve without 6 GHz



Economic Power of 5G

CAN IMPACT GLOBAL ECONOMY IN 2030 BY $961BN...



… BUT SPECTRUM CONSTRAINTS RESTRICT VALUE

Optimal Scenario

$961bn

0.68% of GDP

Constrained Scenario

$594bn

0.42% of GDP

The Socio-Economic Benefits of Mid-band 5G GSMA Intelligence 2022

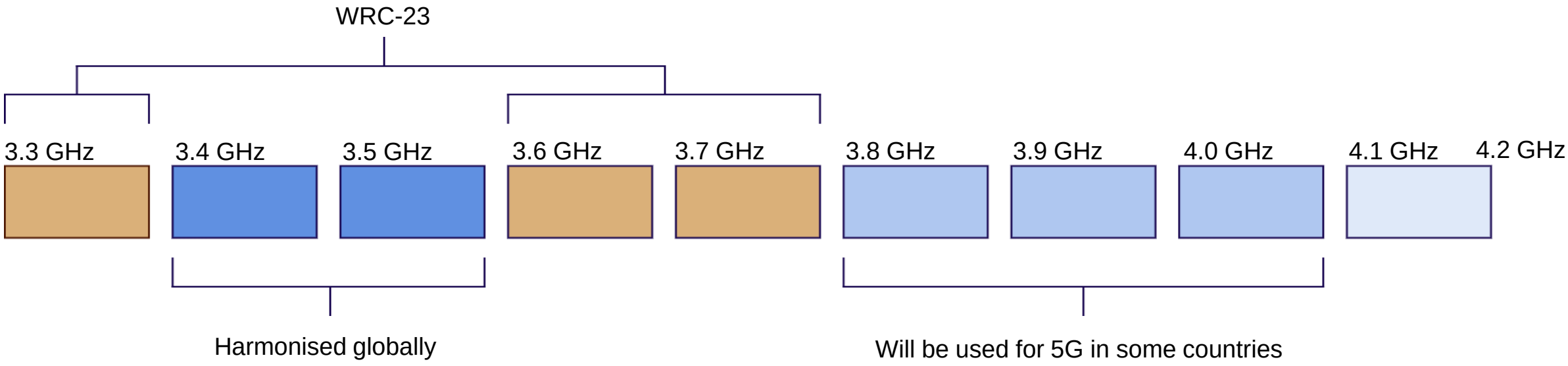
WRC-23 Agenda Item 1.2

100 MHz channels improve performance and reduce cost of connectivity

Agenda Item 1.2: deals with consideration of the following bands for IMT identification

- 3 300-3 400 MHz and 3 600-3 800 MHz (Region 2);
- 3 300-3 400 MHz (amend footnote in Region 1);
- 7 025-7 125 MHz (globally);
- 6 425-7 025 MHz (Region 1);
- 10-10.5 GHz (Region 2)

3.5 GHz range


WRC-23
3.3 GHz
3.4 GHz
3.5 GHz
3.6 GHz
3.7 GHz
3.8 GHz
3.9 GHz
4.0 GHz
4.1 GHz
4.2 GHz
Harmonised globally
Will be used for 5G in some countries

Draft CPM Text Section 1/1.2 CPM23.2/0001

- Chapter 1: Fixed Mobile and Broadcasting Issues (Agenda items1.1, 1.2, 1.3,1.4 and 1.5)
- Sections 1 and 2 provide Executive Summary and Background
- Section 3: Summary of technical studies
- Section 4: Methods to satisfy each agenda item
- Section 5: Regulatory Examples for each of the Methods. For AI 1.2 based on:
    - Allocation status for Mobile service in a band considered for AI 1.2
    - IMT identification
    - Conditions if any necessary on IMT to protect existing Services

Status in Citel 3.3-3.4 GHz

- IAP supported by ARG, B, BLZ, CTR, DOM, EQA, MEX, PRG, URG
- Method 2B in draft CPM Report
- Upgrading mobile service secondary allocation to primary
- Mods to FN’s 5.429C and 5.429D for IMT identification in R2 and any other consequential changes.

Current Provisions for IMT in 3.6-3.7 GHz

5.434 In Canada, Chile, Colombia, Costa Rica, El Salvador, the United States and Paraguay, the frequency band 3 600-3 700 MHz, or portions thereof, is identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. 9.21 with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3 600-3 700 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-19)

Issues to address for 3.6-3.8 GHz

- Expand countries to all countries in R2
- Change Frequency band to 3.6-3.8 GHz
- Need for Conditions?
    - RR9.17 and 9.18
    - RR9.21
    - pfd trigger at the border
    - Article 21-4 pfd Table for space stations

CPM Methods for 3.6-3.8 GHz

Band 3: 3 600 - 3 800 MHz (Region 2)

- Method 3A: No change.
- Method 3B: Identification of the frequency band 3 600-3 800 MHz for IMT in Region 2 with conditions (RR Table **21-4**).
- Method 3C: Identification of the frequency band 3 600-3 800 MHz for IMT in Region 2 with conditions (RR Table **21-4**, pfd limit and RR Nos. **9.17**, **9.18**).
- Method 3D: Identification of the frequency band 3 600-3 800 MHz for IMT in Region 2 with conditions (RR Table **21-4**, pfd limit (short-term criteria) and RR Nos. **9.17**, **9.18**).
- Method 3E: Identifications of the frequency band 3 600-3 700 MHz for IMT in additional countries in Region 2 in RR No. **5.434** while maintaining all existing conditions.
- Method 3F: Identification of the frequency band 3 600-3 700 MHz for IMT in Region 2 by modifying RR No. **5.434** while maintaining all existing conditions.

Status in Citel: 3.6-3.8 GHz

- DIAP 1: USA, PRU, [URG]
- Method 3B in the draft CPM report
- **5.434** In Region 2, the frequency band 3 600-3 800 MHz, or portions thereof, is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Stations of the mobile service, including IMT systems, in the frequency band 3 600-3 800 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations .

Status in Citel: 3.6-3.7 GHz

- DIAP 2 : ARG, BOL, MEX
- Method 3E of the CPM report
- 5.434 In Canada, Chile, Colombia, Costa Rica, El Salvador, the United States and Paraguay, [ADD name of countries] the frequency band 3 600-3 700 MHz, or portions thereof, is identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination, the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. 9.21 with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3 600-3 700 MHz shall not claim more protection from space stations than that provided in Table 21 4 of the Radio

Status in Citel for 6425-7025(R1) and 7025-7125 GHz (Global)

- DIAP for NOC supported by USA, CTR, DOM
- It is Modified Method 4A NOC (No Change) for the band 6425-7025 MHz applied globally, and Method 5A NOC for the global band 7025-7125 MHz

Status in Citel: 10-10.5 GHz

- 10.5 GHz: DIAP supported by B, DOM, EQA, PRU, URG
- Method 6B of the draft CPM report
  - Primary allocation in the band 10-10.5 GHz for R2
  - IMT identification in the band for R2
  - Mods to FN’s 5.480 and 5.481dealing with existing Mobile and Fixed service primary allocation in some R2 countries
  - Conditions contained in a draft new WRC resolution

GSMA

Summary

- 5G development and expansion needs sufficient mid band bandwidth for lower network density/costs.
- Access to core mid-band spectrum in 3.5 GHz and 6 GHz range is crucial for 5G and WRC-23 is key opportunity.
- Citel countries have developed Preliminary proposals, Draft IAP's and IAP's for IMT Agenda items.
- CTU members may review the work of ITU-R and of Citel with a view to develop/ support proposals for AI 1.2 and other Agenda items.
- Input from CTU members to Citel is key to further development and finalization of Citel common proposals.