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# **Spectrum for Audio Content Production**

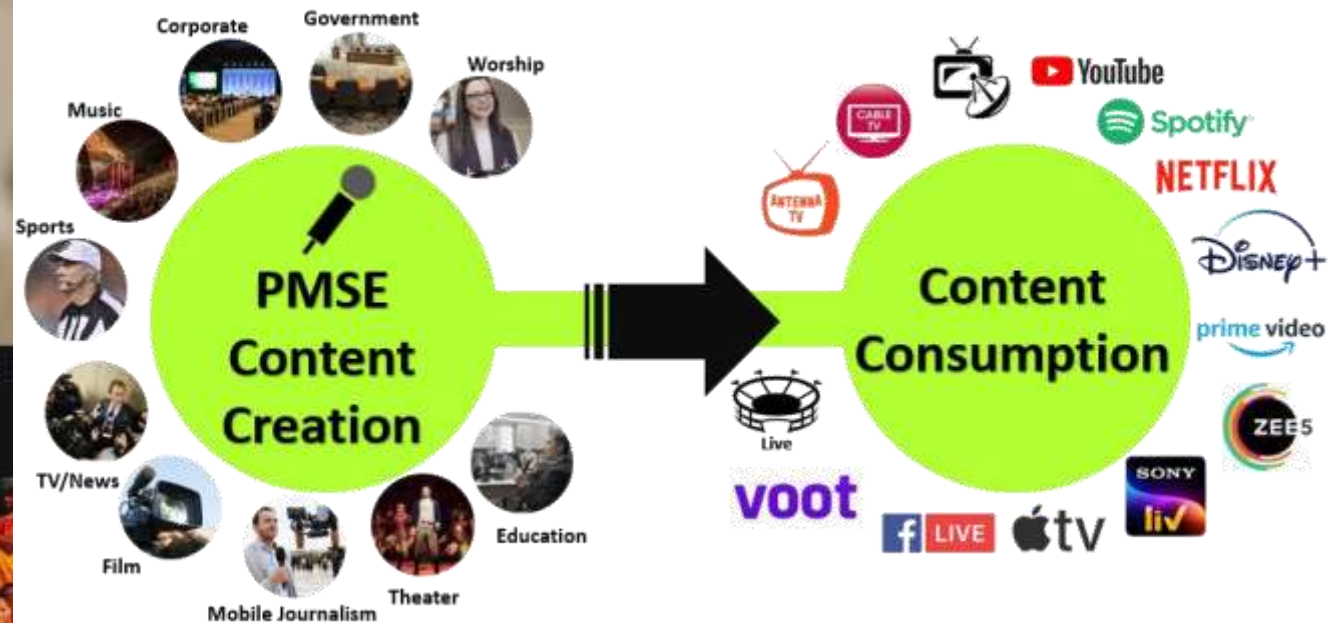
**Prakash Moorut, Global Head of Spectrum and Regulatory Affairs**

**October 2023**

# Program Making and Special Events

## PMSE devices include:

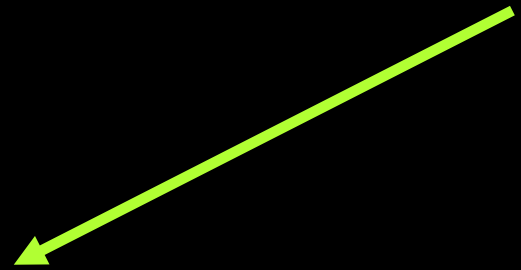
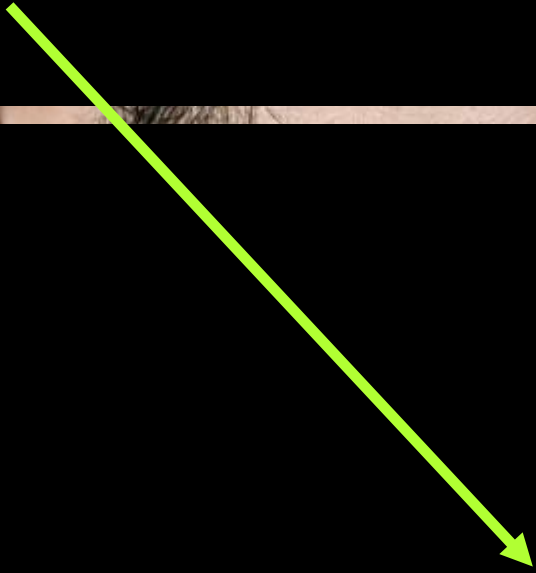
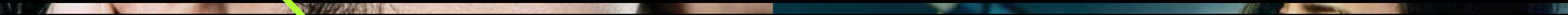
- wireless microphones
- in-ear monitoring systems
- talk-back systems
- wireless video cameras



Preferences in how content is consumed are evolving rapidly

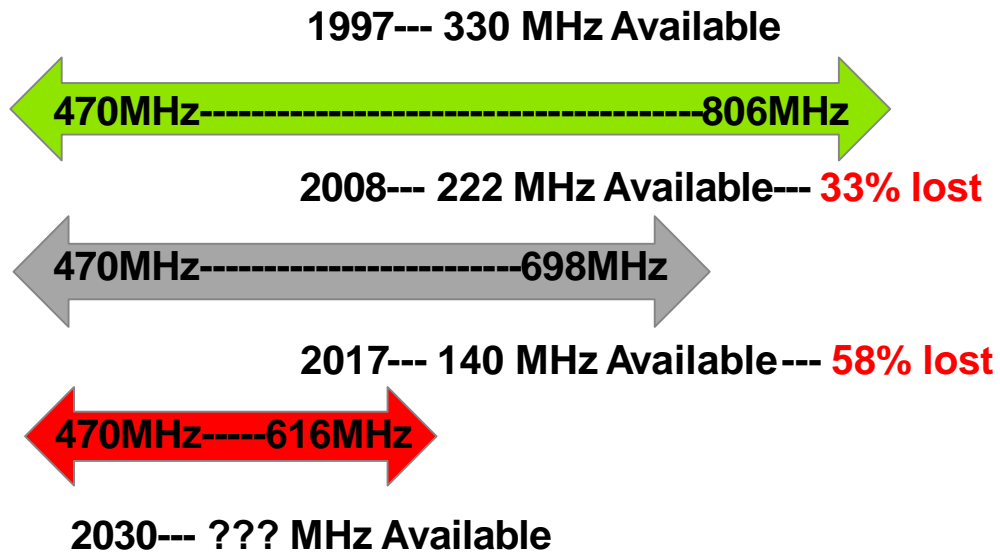
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**Bodypack Transmitter**



**In Ear Monitors**

# PMSE Spectrum Access- Breaking point reached in the U.S.?



**TV UHF band (470 MHz-1GHz) provides favorable propagation, low body absorption effects and interference free operation.**

**Hard to find spectrum in TV-UHF band for major events like Super Bowl since the 600 MHz auction to mobile operators**

[See "Super Bowl LVII: Phoenix, State Farm Stadium Raise RF Coordination to New Level", By Dan Daley, Audio Editor, January 18, 2023.](#)

Bodypack Transmitters



**Notes:**

- 6 MHz is subtracted for the Radio Astronomy channel 608-614 MHz which has never been available to PMSE.
- 616-617 MHz is a guard band-- not available for PMSE use (or any use) so subtracted that as well.
- This does not include the 653-663 MHz duplex gap.

# Global Events- Similar trends

## UAE World Expo 2020



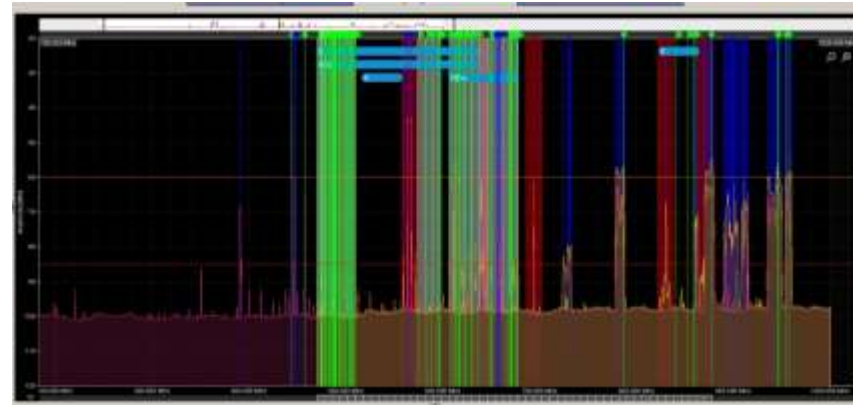
## Indian Premier League 2023



## Paris Olympics 2024



- Almost all of 470-710 MHz range was used at UAE Expo (few TV channels)



- 470-694 MHz range was used during IPL opening ceremony

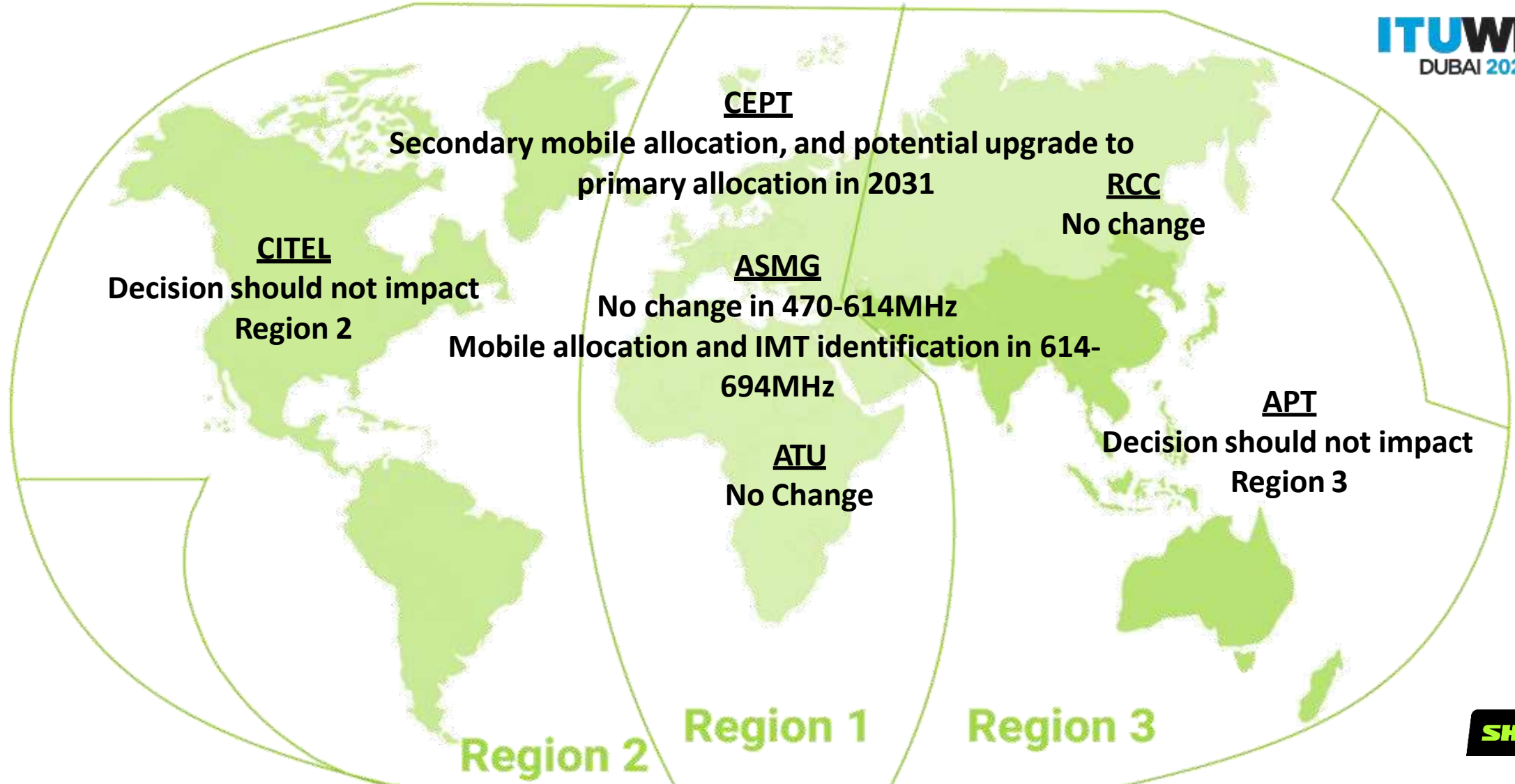
- Not enough spectrum for **PMSE** in TV-UHF (470-694 MHz) band.
- Open **1240-1260 MHz & 1350-1400 MHz** for wireless mics.
- [Spectrum planning](#) document recommends using **wired communication system wherever and whenever possible.**

# WRC-23 Agenda Item 15



**ITUWRC**  
DUBAI 2023

Agenda Item 1.5 to consider regulatory actions in 470-694 MHz in ITU-R Region 1  
(Europe, Middle East & Africa)



# U.S. Regulations (1/2)

470 MHz

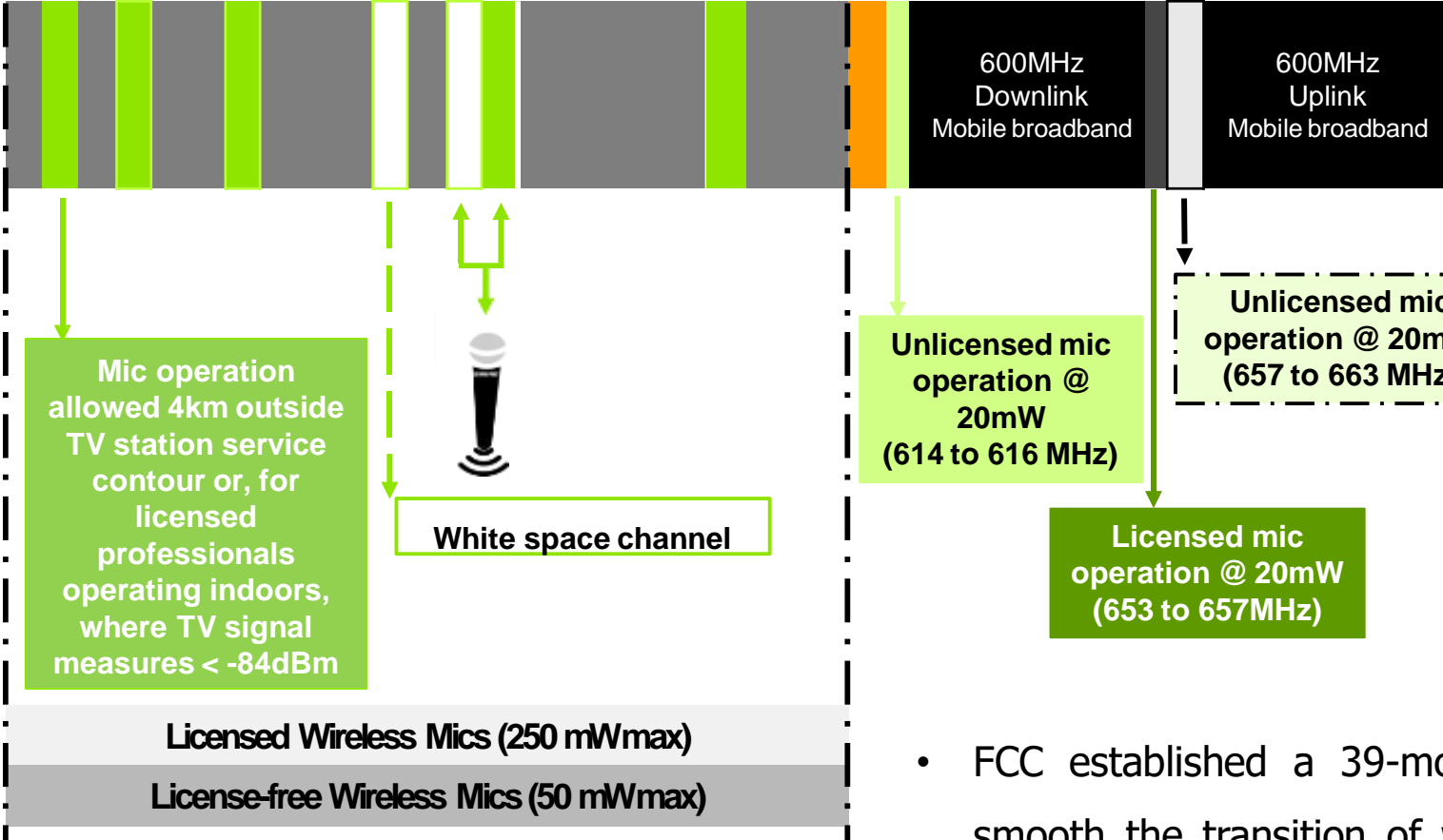
608

617

652

663

698 MHz



- White space channel
- Distant / low field strength TV signal: co-channel operation possible
- Full power TV
- Radio Astronomy Channel #37: **Not permitted for microphone operation.**
- Mobile broadband band: **Not permitted for microphone operation.**
- Guard band: exclusive for **unlicensed** mic operation.
- Duplex Gap: exclusive for **licensed** mic operation.
- Duplex Gap: for **unlicensed** mic operation.

- FCC established a 39-month transition period (see: [link](#)) to help smooth the transition of wireless microphone operations out of the 600 MHz service band to other available frequencies.
- FCC allows operations in 600 MHz mobile band under Special Authorizations.

## U.S. Regulations (2/2)

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- Most wireless microphone users operate **on an unlicensed basis** in the TV-UHF band spectrum.
- **Licensed use:** certain eligible users can obtain licenses if they routinely use 50 or more devices for most events or productions. Ex: broadcast programs, motion pictures, and major events or productions.
- **Additional spectrum** outside of TV-UHF band.






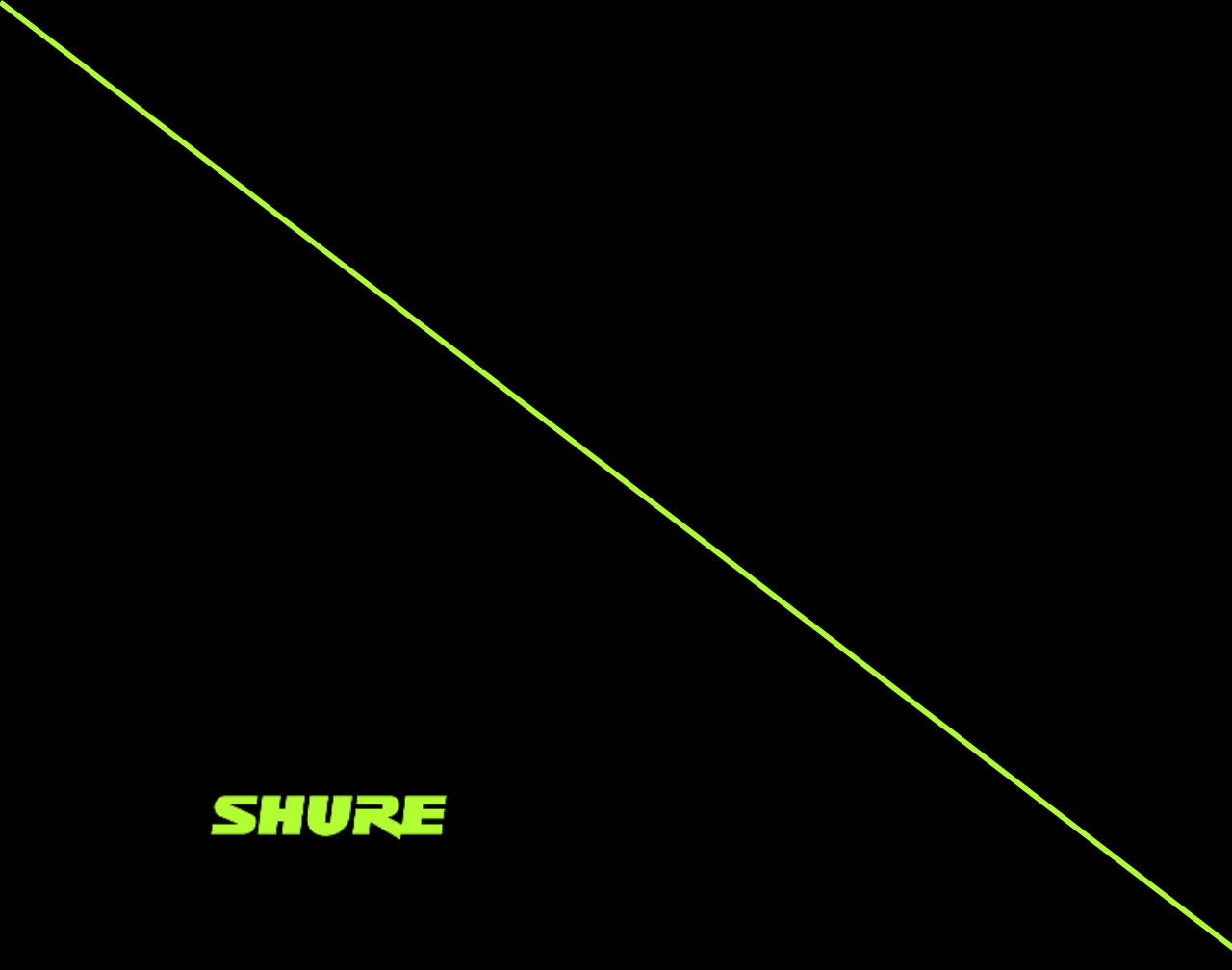
## Key Take-Aways

- PMSE needs continued access to reliable TV-UHF Spectrum (e.g., 470-612 MHz, guard bands, duplex gap) after IMT auction of 612–652 MHz/663–703 MHz.
- Additional spectrum in 1-2 GHz (e.g., on a shared basis with incumbents) to compensate for loss of spectrum to IMT below 1 GHz.
- **For major events:**
  - Administrations need to identify and allocate additional spectrum in addition to recognized audio PMSE bands.
  - Get special access to mobile IMT spectrum blocks in the event's geographical area.

**India's Spectrum Policy should Address Spectrum Needs for Audio Content Production (PMSE)**



**PMSE contributes to the economy and provides an important service for cultural life and content production.**



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**Thank you**