CITEL WRC-15 UPDATE

Creating a sustainable future for mobile broadband

Herman Schepers, Senior Director Spectrum Campaign, GSMA

March 23rd 2015

AGENDA

CITEL Market Update
Geraldo Neto, Senior Manager, Government Affairs
Qualcomm

Recommended New Mobile Bands
Veena Rawat, Senior Spectrum Advisor
GSMA

Conclusions
Herman Schepers, Senior Director,
Spectrum Campaign, GSMA

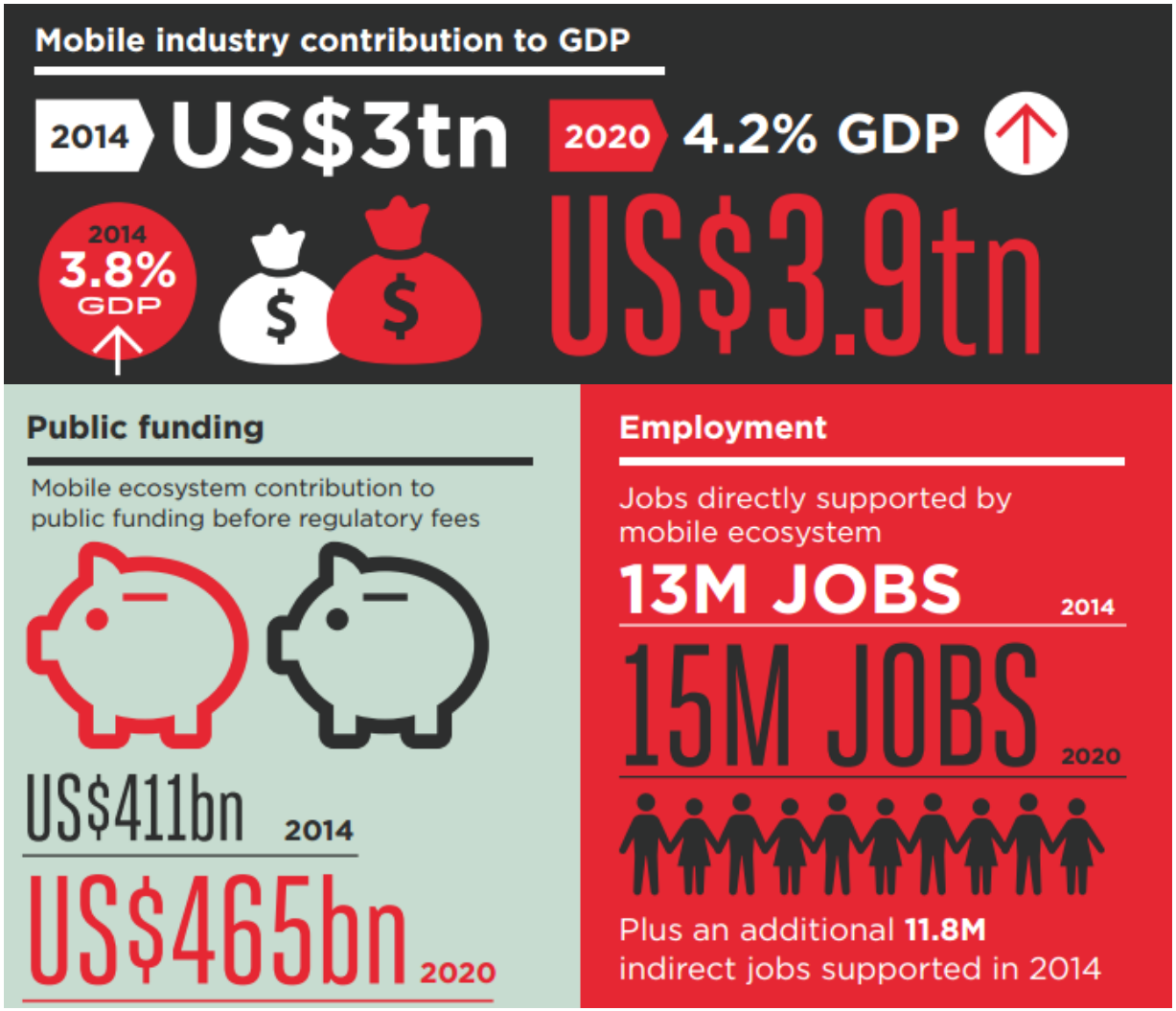
Lunch
GSMA Exhibition Area - CICG building





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GROWING MOBILE ECONOMIC IMPACT



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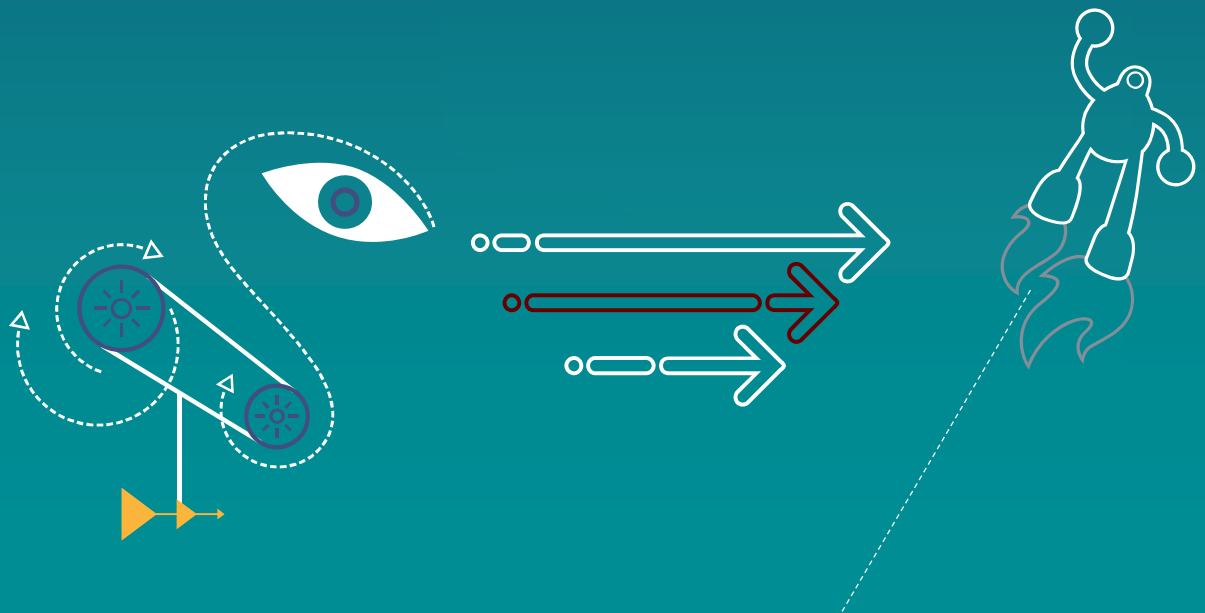
Geraldo Neto
Sr. Manager, Government Affairs

March 2015

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Sr. Manager, Government Affairs

Mobile data demand and the need for more spectrum

QUALCOMM®



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CPM 15-2
CITEL session

Mobile is the largest technology platform in history



~7 billion connections, almost as many as people on earth[1]



Evolving into **Internet of Everything:** cars, meters, sensors, health devices, etc.



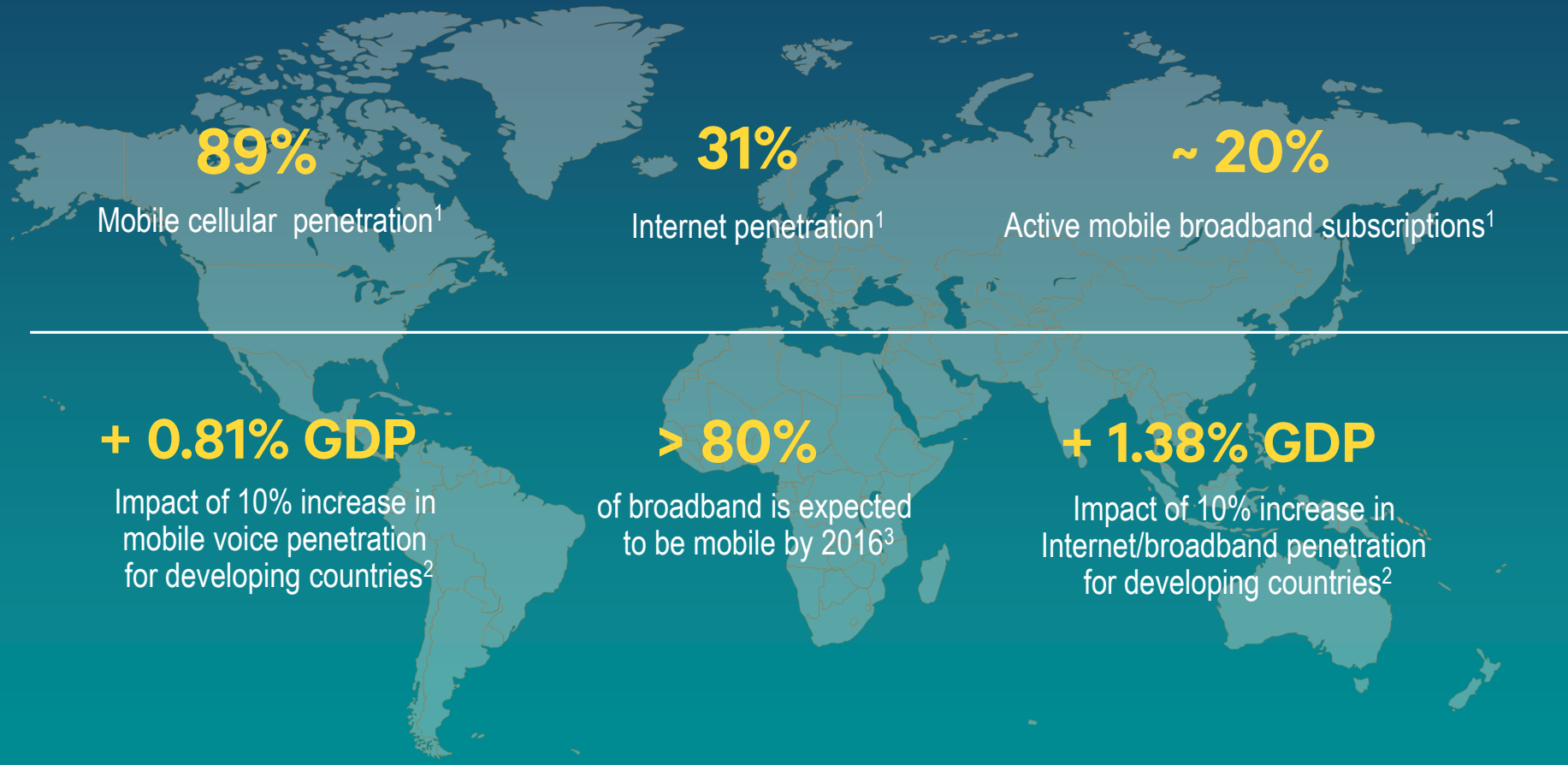
More prevalent than electricity or running water in some regions



At the center of breakthrough experiences like **4K UHD video**

[1] ~7B connections (~3.5B subs) — GSMA Intelligence, Apr. '14.

ICT in developing countries



89%
Mobile cellular penetration[1]

31%
Internet penetration[1]

~ 20%
Active mobile broadband subscriptions[1]

+ 0.81% GDP
Impact of 10% increase in mobile voice penetration for developing countries[2]

> 80%
of broadband is expected to be mobile by 2016[3]

+ 1.38% GDP
Impact of 10% increase in Internet/broadband penetration for developing countries[2]

1 ITU, "The World in 2013: ICT Facts and Figures," (2013) , 2 World Bank Information and Communications for Development 2009: Extending Reach and Increasing Impact, 3 The state of Broadband: Universalizing Broadband (A report by the Broadband Commission, Sept. 2013)

Licensed spectrum is the foundation to 1000x



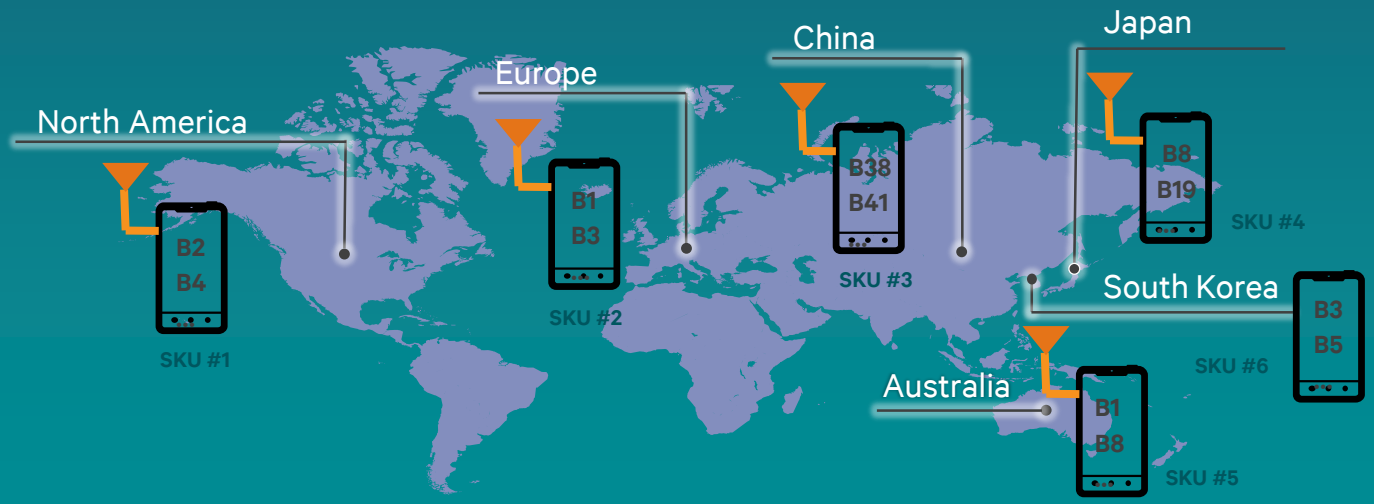
For both licensed & unlicensed spectrum
(evolving LTE Advanced and Wi-Fi)

More licensed spectrum is the top priority
Use unlicensed spectrum opportunistically

- LTE - Wi-Fi aggregation for carrier Wi-Fi
- LTE-U for new small cells

Global nature of LTE requires more than local solutions

- The importance of harmonization
  - Multiple Designs (several SKUs)
  - Multiple NRE
  - Fragmented BOM
  - More inventory
  - Single design (single SKU)
    - Reduced NRE
    - Consolidated BOM
    - Less inventory



Single SKU helps increase the volume and reduce the costs to make LTE mainstream

Recommendation

New identification of licensed spectrum for IMT

- The growth of mobile data traffic requires the identification of more spectrum for IMT
- Several bands being discussed based on the WP 5D and JTG 4-5-6-7 studies that will be input to WRC-15
- L-band with strong support at CITEL (IAP with 15 countries)



It is important for the region that administrations support the process in CITEL and the ITU

Thank you

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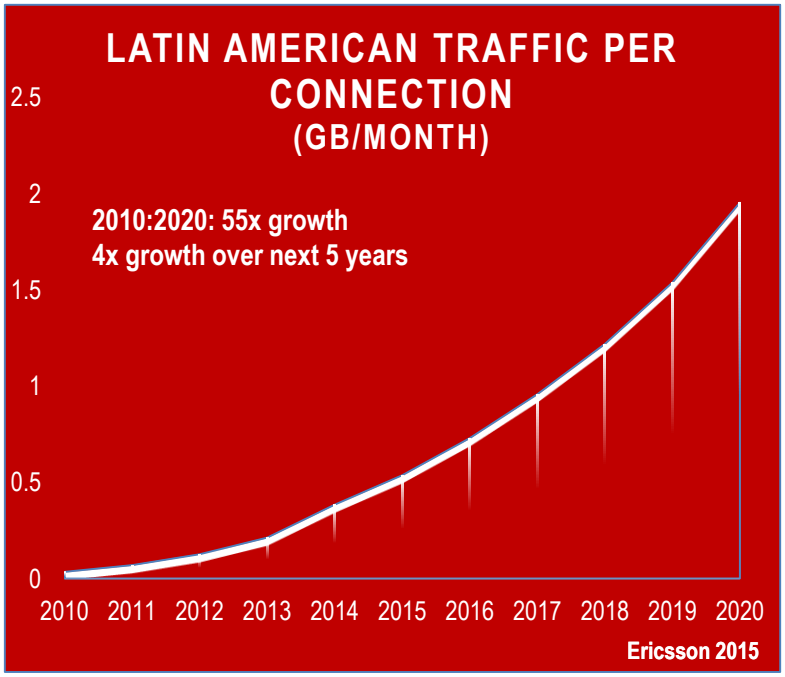
FUTURE MOBILE SPECTRUM IN THE AMERICAS

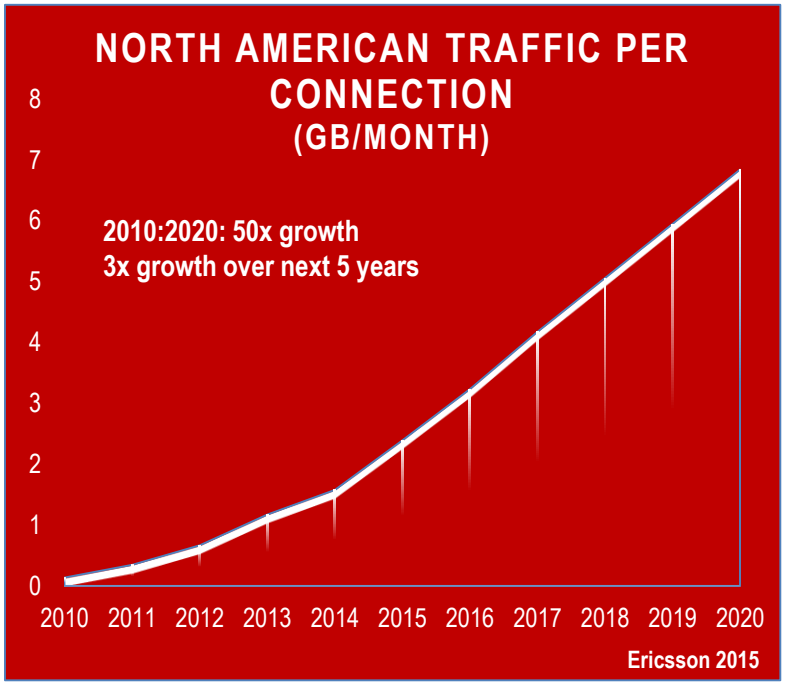
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MOBILE REVOLUTION IN AMERICAS





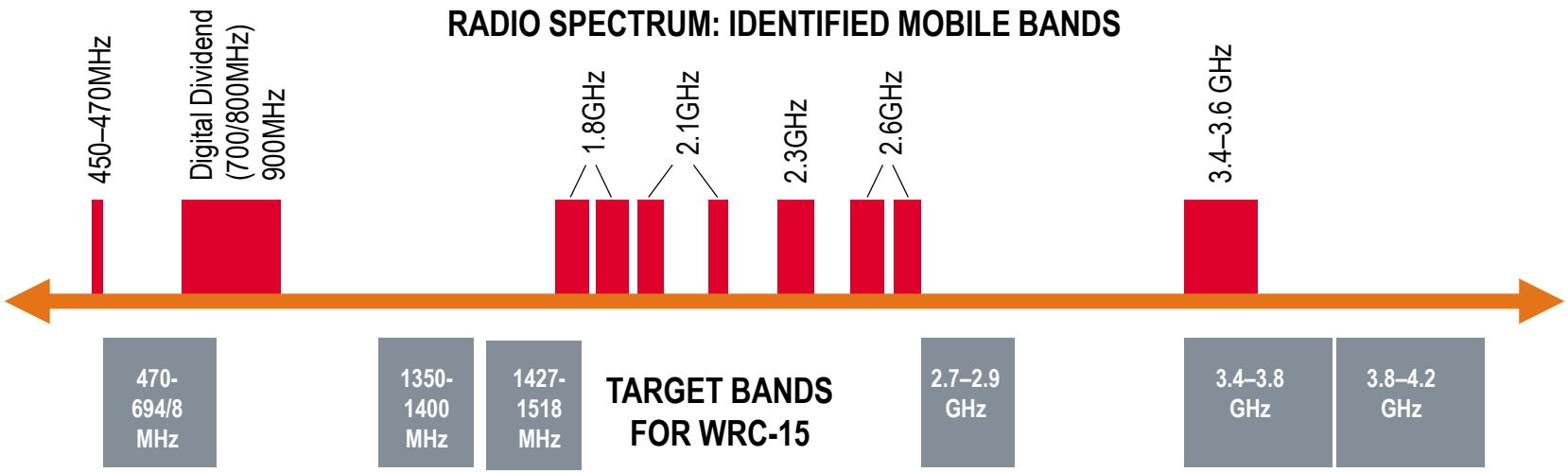
- **GSMA findings show 600-800MHz more mobile spectrum needs be allocated by 2020**
  - This accounts for new tech (e.g. LTE-A), small cells and Wi-Fi offload which operators use increasingly
- **This needs to be identified at WRC-15 to meet data demand in 2020-2025**
  - Can take around a decade to ready new mobile allocations for licensing then launch services
  - Existing unlicensed mobile spectrum will be essential to support data rises for the next 5-10 years

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SOURCE: ERICSSON MOBILITY REPORT 2015 & CISCO VNI 2015

NEW BANDS FOR MOBILE

- **GSMA had agreed widespread mobile operator support for 4 new mobile allocations**
  - Sub-700MHz UHF (470-694/8MHz)
  - 2.7-2.9GHz
  - L-Band (1350-1400MHz & 1427-1518MHz)
  - C-Band (3.4-4.2GHz)
- **Takes 5-10 years to ready new bands**
  - Existing bands will support growth in next 5 years
  - The bands will be needed to meet demand in 2020-2025
- **Bands can be harmonised regionally/ globally to drive lower cost devices**
  - Supporting others risk creating fragmentation



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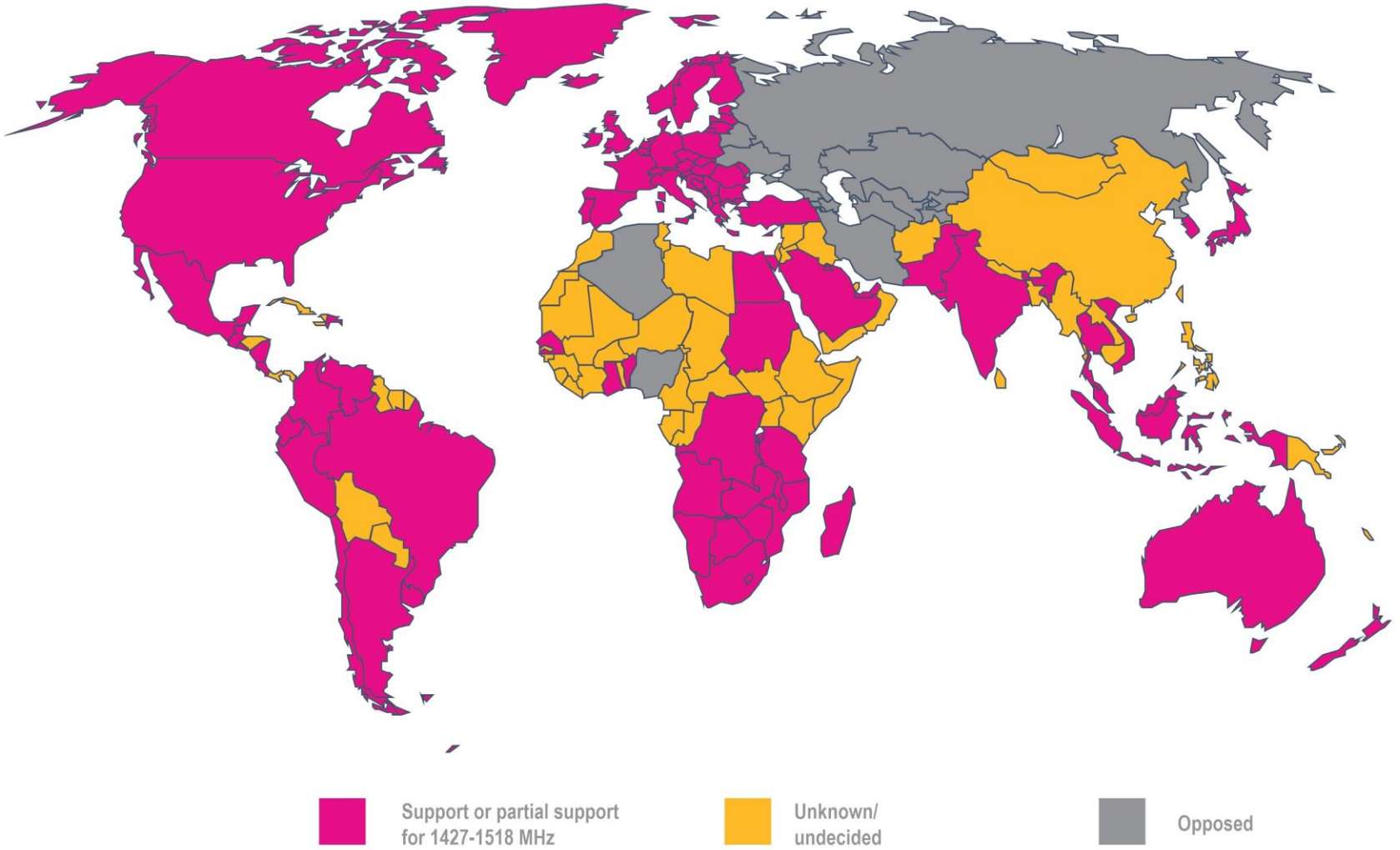
SHARING CONSIDERATIONS

BANDS MUST BE SHARED TO INCREASE OVERALL SPECTRUM EFFICIENCY

- **We encourage regulators to look at ways of sharing bands**
  - Most bands are not allocated exclusively for one service in the Radio Regulations
- **Sharing is demonstrably possible if we consider realistic scenarios and not the worst case**
  - Possible by segmenting bands or geographic sharing
  - Opponents to our bands typically argue that sharing isn't possible based on unrealistic scenarios (e.g. huge exclusion zones)
- **Numerous incumbents are emphasising highly unrealistic scenarios**
  - **Sub-700MHz (470-694/8MHz):** some argue co-channel sharing requires 274-1000km exclusion zones premised on one country putting TV transmitters on its borders pointing directly at neighbour - more realistic scenarios showed 14km exclusion zones adequate
  - **L-band (1350-1518MHz):** some argue exclusion zones would be 500km wide and require a 7.8MHz guard band BUT this was premised around 1km tall LTE base stations. A study with more realistic heights found a 2km exclusion zone was adequate and a 3MHz guard

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COMMITMENT TO MOBILE IN A PORTION OF L-BAND



Source: Plum Consulting

SUB-700MHz (470-694/8MHz)

EXTREMELY IMPORTANT FOR SCALING AFFORDABLE MOBILE BROADBAND SERVICES EVERYWHERE INCLUDING IN RURAL AREAS & INSIDE BUILDINGS

CURRENT UHF USAGE (470-694/8MHz):

- Mostly supports terrestrial broadcast TV services (together with VHF)
- Use of terrestrial broadcast varies by country
  - In many countries it supports lots of channels and is heavily watched
  - In others it is heavily watched but supports few channels
  - In others it is little used (ie. cable, satellite & IPTV dominate)
- The 600MHz band is set to be licensed for mobile in the US

EXISTING SUPPORT:
Canada, US, Mexico, Finland, Switzerland, Denmark, Egypt, Jordan, Ghana, Colombia (part). *Entire band is co-allocated to mobile on primary basis in Asia Pacific*

HOW TO ACCOMMODATE MOBILE *IN A PORTION*:

- The evolution of terrestrial broadcast delivery means more can be done with less spectrum
  - More efficient broadcast tech & changing viewing habits mean broadcast can use less spectrum
- Less demand for large number of TV channels in future (in many countries) as IPTV use grows

VARIATION IN NATIONAL BROADCAST USE MEANS REGULATORS NEED FLEXIBILITY TO USE THE BAND AS THEY WISH ESPECIALLY GIVEN IMPACT ON MOBILE COVERAGE

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*For more details on segmentation of this band, please see document APG15-4/INF-17

C-BAND (3.4-4.2 GHz)

EXCELLENT CAPACITY BAND – SUPPORTS BEST POSSIBLE MOBILE EXPERIENCE

CURRENT USAGE:

- Mostly used for the Fixed Satellite Service (FSS) worldwide
- Already used for mobile broadband in some parts of the world



HOW TO ACCOMMODATE MOBILE *IN A PORTION*:

- Portion could be freed in future as FSS is increasingly moving to higher bands (e.g. Ka & Ku) which provide better value, better quality services
- Sharing studies prove satellite & IMT can use the band under the right conditions
  - When a C-band *portion* is assigned for IMT in city centres, and *full* FSS use continues in rural areas, a separation distance **of 5km** would typically be required*
  - Several markets already use the band for both including an LTE service in the UK

IN ASIA PACIFIC THE USE OF MOBILE IN THE BAND WOULD DRIVE 100k NEW JOBS AND DRIVE US$53BILLION IN GOVERNMENT REVENUES

EXISTING SUPPORT:

- Existing IMT footnote for 3.4-3.6 GHz in 91 region 1 countries and 10 region 3 countries
- Common Region 1 mobile proposal for 3.4-3.8 GHz
- Strong agreement for 3.4-3.6/7 GHz in Region 2

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*For more details on C-band co-existence, please see document APG15-3/INF-03 and APG15-4/INF-17

**See Frontier Economics' report: "Economic assessment of C-band re-allocation".

CONCLUSIONS

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PROGRESS ON MOBILE AGENDA ITEM IS VITAL

THE FUTURE OF MOBILE BROADBAND IS AT RISK WITHOUT MORE SPECTRUM

- **Mobile traffic is growing faster than anyone's expectations**
  - 2015-2020: 10x traffic growth currently expected
- **Unless significant progress is made on Agenda Item 1.1, it could fail in its goal**
- **Networks could slow, consumer prices may rise, socio economic benefits lost**
- **Americas ultimately benefits from low cost devices by supporting higher IMT spectrum demands**
  - Advanced markets who use the bands first will drive equipment economies of scale later
- **Flexibility is essential to allow countries to react to their evolving situations**
  - New bands won't be licensed to operators until governments see clear demand



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THANK YOU – ANY QUESTIONS?

FUTURE MOBILE SPECTRUM
IN AMERICAS

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