

SPECTRUM

SUPPORTING FAIR AND TRANSPARENT REGULATION

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5G needs spectrum across three ranges



Sub-1 GHz

1-6 GHz

AND ABOVE

6 GHz



Sub-1 GHz bands

850
MHz

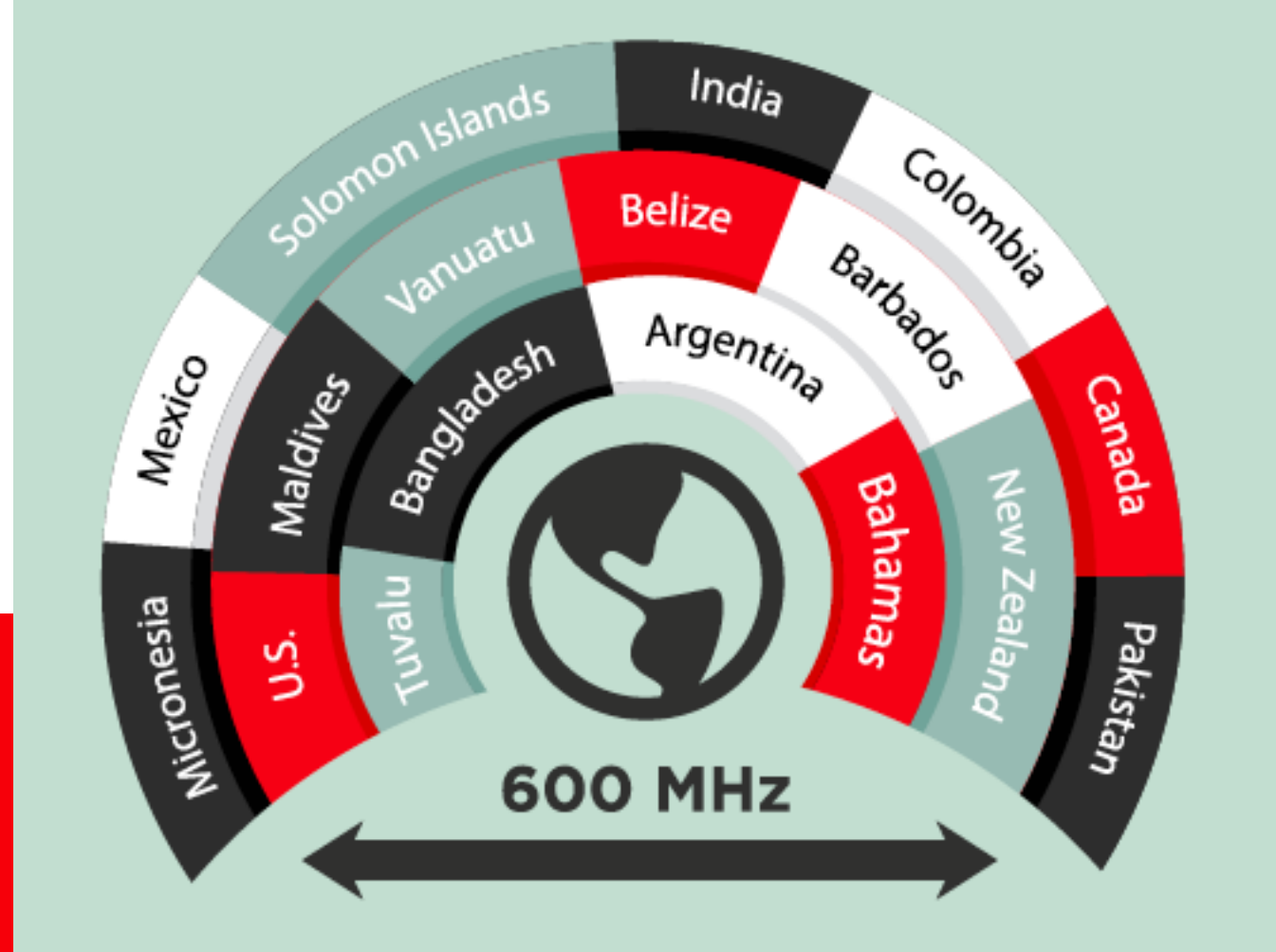
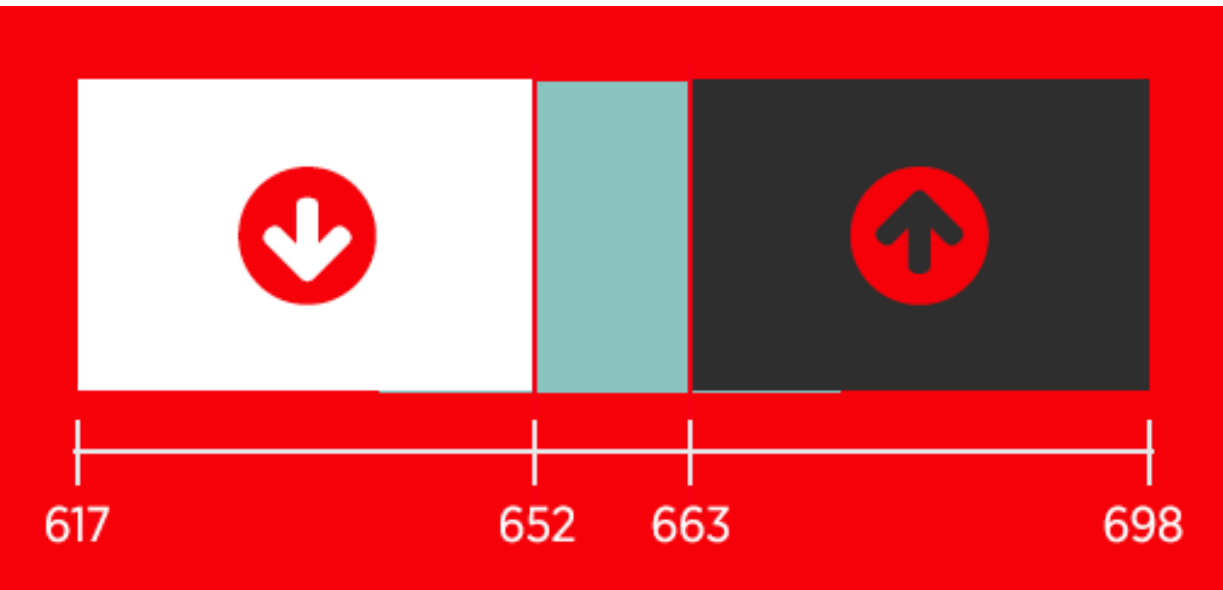
900
MHz

700
MHz

600
MHz

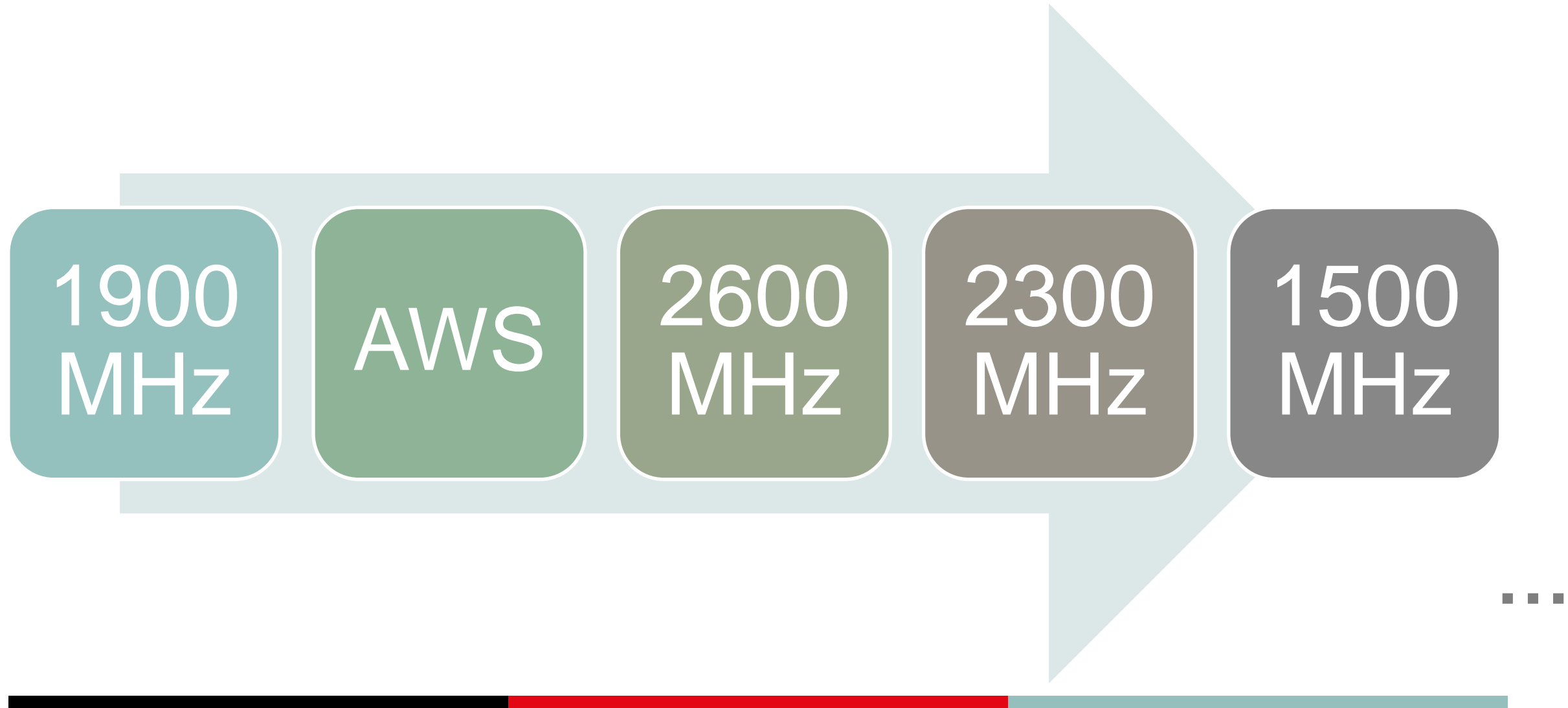


The 600 MHz Band





Bands between 1 and 6 GHz





And the C Band

MHz	3300	3400	3500	3600	3700
1	TDD				

Europe	3400-3800 MHz
EUA / Canada	3550-3700 MHz Consultation for 3700-4200 MHz
Middle East	3300-3800 MHz
Africa	3300-3600 MHz
Australia	3400-3700 MHz Consultation for 3700-4200 MHz
Colombia / Costa Rica Argentina +13 Mexico	3300-3700 MHz 3300-3600 MHz 3300-3400 → 3300-3700 MHz

More contiguous spectrum

80-100 MHz per MNO

IN MID-BANDS AND

1 GHz per MNO

IN mmW





Bands above 24 GHz

A LOT AT STAKE AT WRC-19

The 5G work at WRC-19, centered around Agenda Item 1.13 (AI 1.13), looks at IMT spectrum in frequencies between **24.25 and 86 GHz**. The result will have a major impact on the future of 5G.



A successful identification of spectrum for IMT under Agenda Item 1.13 is vital to realise the full potential of 5G networks



The GSMA supports the 26 GHz and 40 GHz bands



The GSMA also supports 66-71 GHz



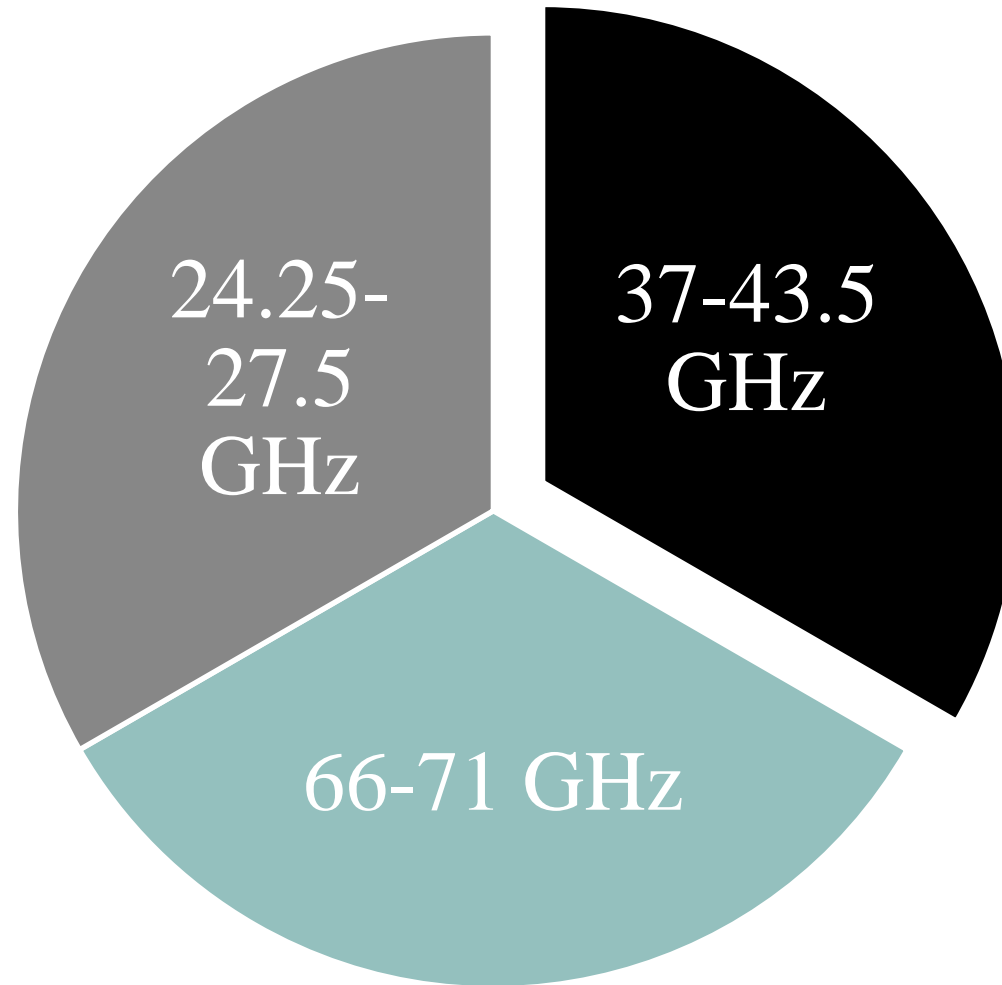
Technical studies show that coexistence between IMT and other services is possible



Due to the large amount of spectrum needed for 5G services, the range 45.5-52.6 GHz also needs to be considered

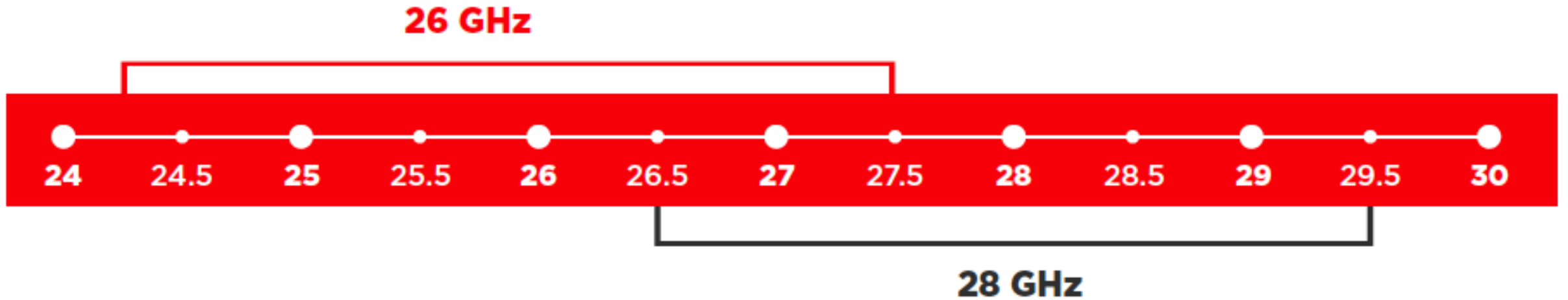


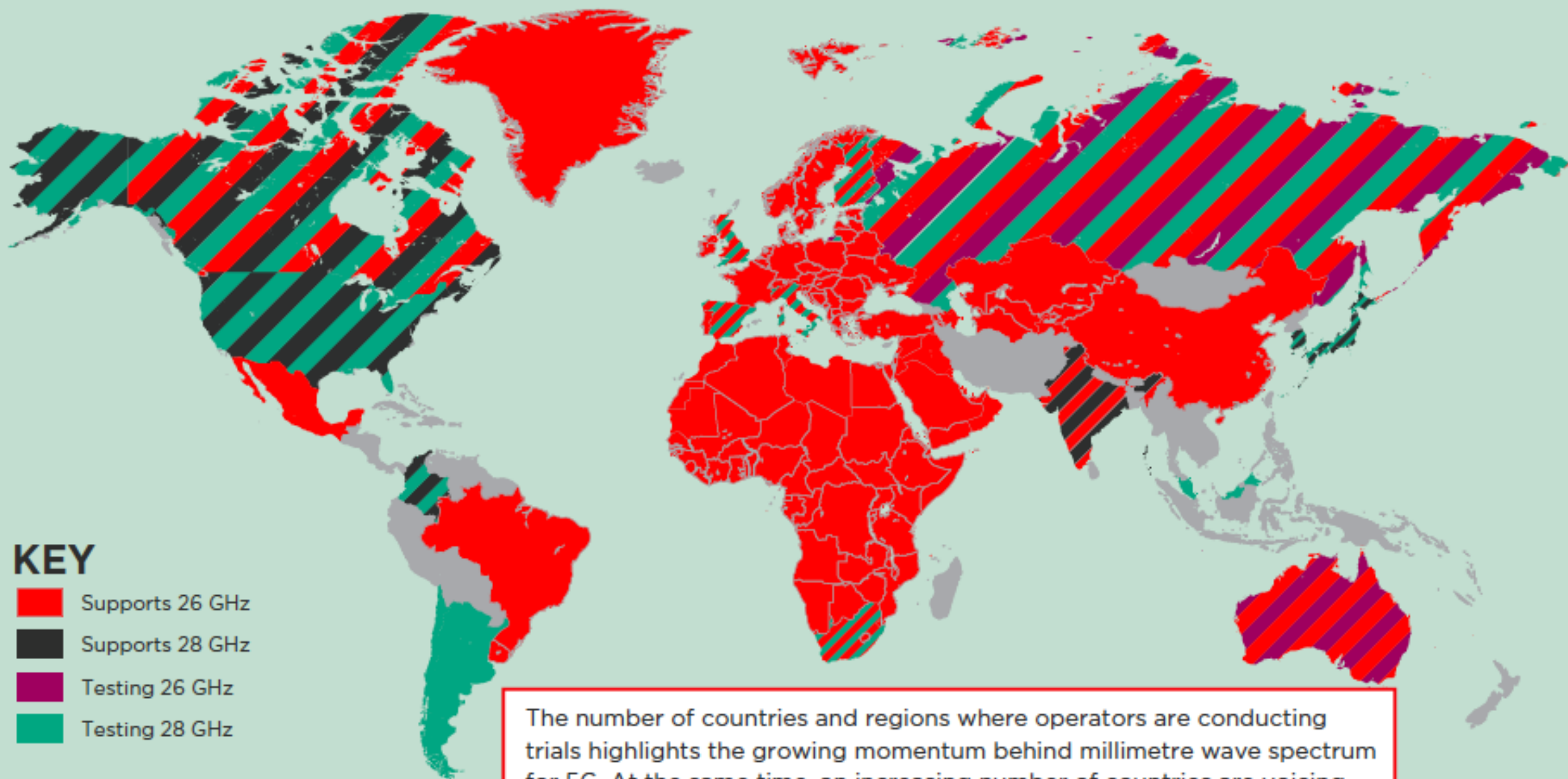
Target Bands at WRC-19





What About 28 GHz?





KEY

-  Supports 26 GHz
-  Supports 28 GHz
-  Testing 26 GHz
-  Testing 28 GHz

Source: GSMA Intelligence
September 2018

The number of countries and regions where operators are conducting trials highlights the growing momentum behind millimetre wave spectrum for 5G. At the same time, an increasing number of countries are voicing their support for 26 GHz and 28 GHz.



The socio-economic benefits of mmWave 5G (2020-2034)

Latin America and Caribbean Edition

GDP impact of mmWave spectrum by 2034

 **\$20.8 billion**

TAX
\$5.8bn

1.2%

GDP growth

THE GROWING IMPORTANCE OF MMWAVES



63%



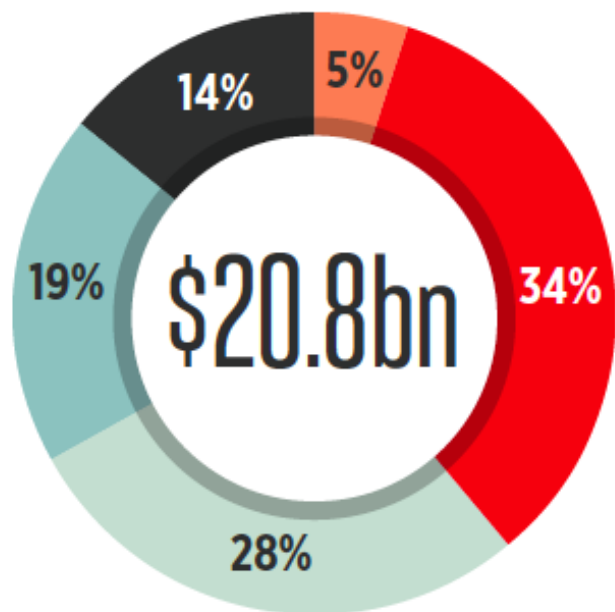
Rapid rise:
mmWave
contribution
to GDP to
grow 63%
annually

11%
2025

25%
2034

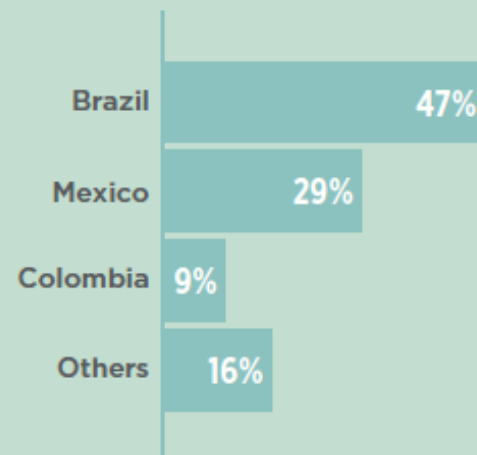
The share of 5G services using mmWaves

WHAT INDUSTRIES WILL BE MAKING THE BIGGEST CONTRIBUTIONS BY 2034?



- Agriculture, mining, quarrying
- Manufacturing, utilities, construction
- Professional and financial
- Government, public security, education and health
- ICT and trade

From what countries will contributions come from?



High-speed broadband in home and office



High-speed mobile broadband to homes, offices and public spaces is one of the first 5G use cases being implemented. Fibre-like ultra-high speeds will need the capacity of mmWave 5G.

Quick deployment/temporary connectivity



The transmission of live events and disaster response efforts require ultra-high speeds and low latency to deliver a high-quality experience to all kinds of users.

Industrial automation



Large-scale industrial automation relies on mmWaves. That's because next-generation manufacturing will produce large amounts of data. Low-latency communication is also crucial.

Remote object manipulation



Low latency and data rate requirements mean mmWave connectivity is expected to play an important role here including advanced healthcare applications.

Virtual reality and meeting



Thanks to latency and peak data rate requirements, mmWaves will benefit virtual and augmented reality. For example, educational applications are likely to produce high volumes of data that will rely on mmWave 5G.

Next-generation transport connectivity

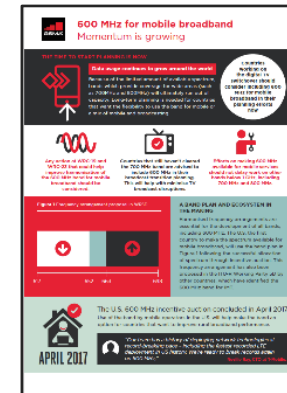
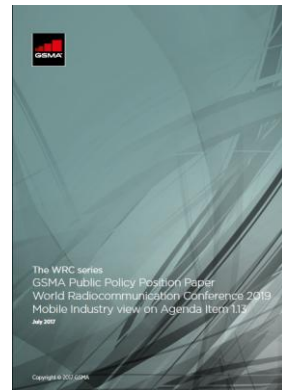
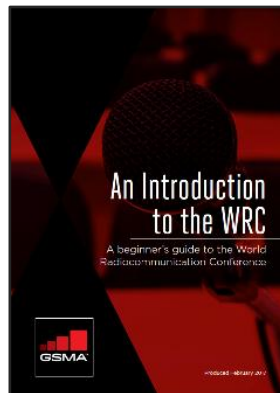


High data volumes and high-density real-time communications must be addressed by a combination of mmWave and lower bands to enhance services, especially in cities with dense traffic.



We are starting to ramp up our WRC-19 efforts

THE GSMA WRC SERIES



<https://www.gsma.com/spectrum/wrc-series>