

Huawei views on the use of the 470-694 MHz band for IMT

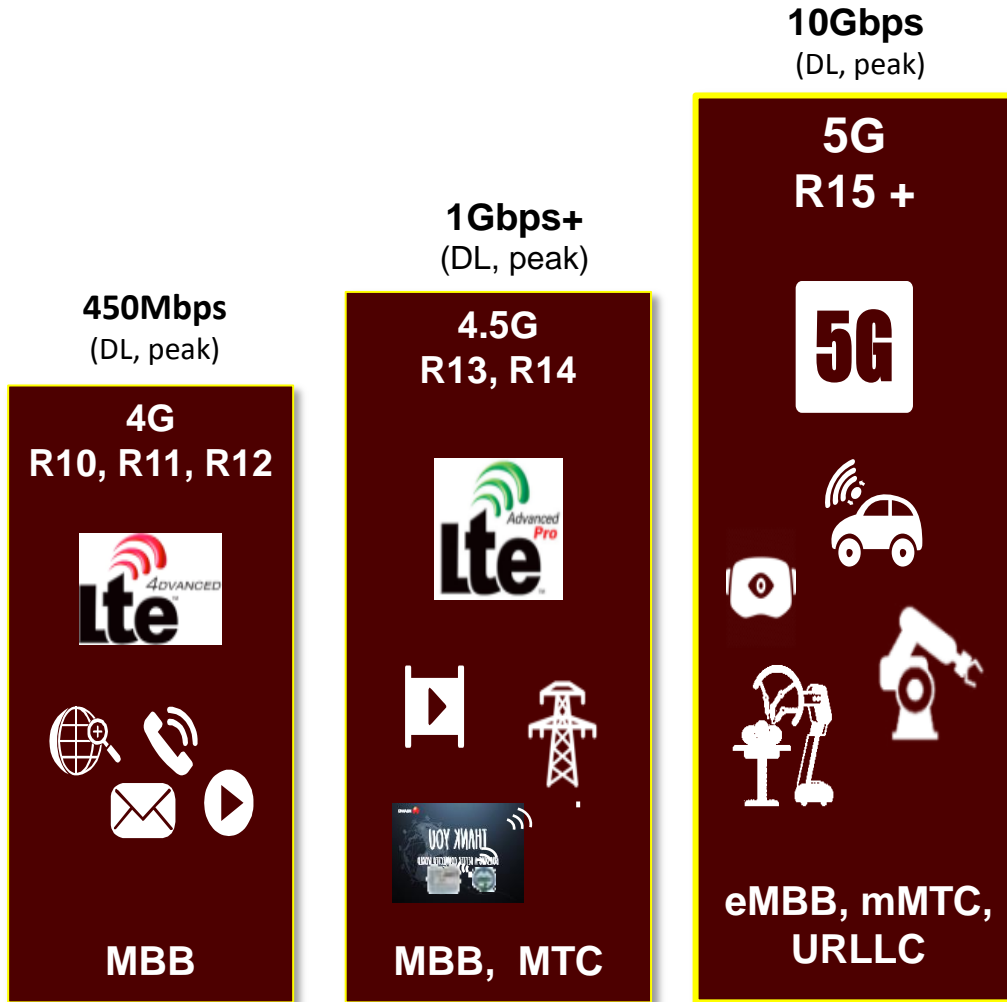
Alexander Gulyaev
Senior Manager, European Spectrum Policy

ITU-D Regional Seminar for Europe and CIS
“Spectrum Management and Broadcasting”
29-31 May, 2017, Rome, Italy

Contents

- Multi-frequency approach to address IMT use cases
- ITU-R and regional activities on IMT in 470-694/698 MHz
- TV content consumption trends
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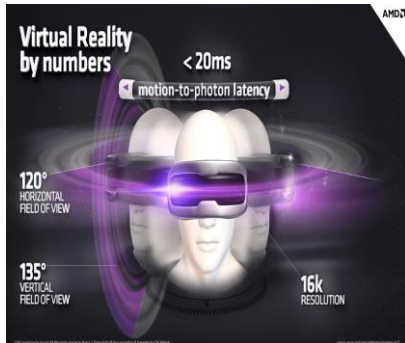
IMT Evolution Path



Key regulatory requirements to enable the IMT evolution:

1. Enable **economies of scale** by selecting bands with high potential for harmonization
2. Ensure **coverage & capacity** by making available both **low and high** frequencies
3. Timely develop appropriate **regulatory frameworks**

Examples of Current and Future IMT Use Cases



Cloud Based AR/VR
e.g. Retina experience,
Avoid Motion Sickness
Low latency



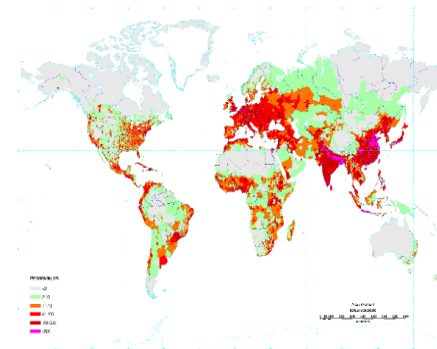
Connected Car
e.g. Comfort Driving
High automation &
full automation



Energy Smart Grid
Network Slices, 99.999%
Reliable,
Ultra low latency, Deep coverage

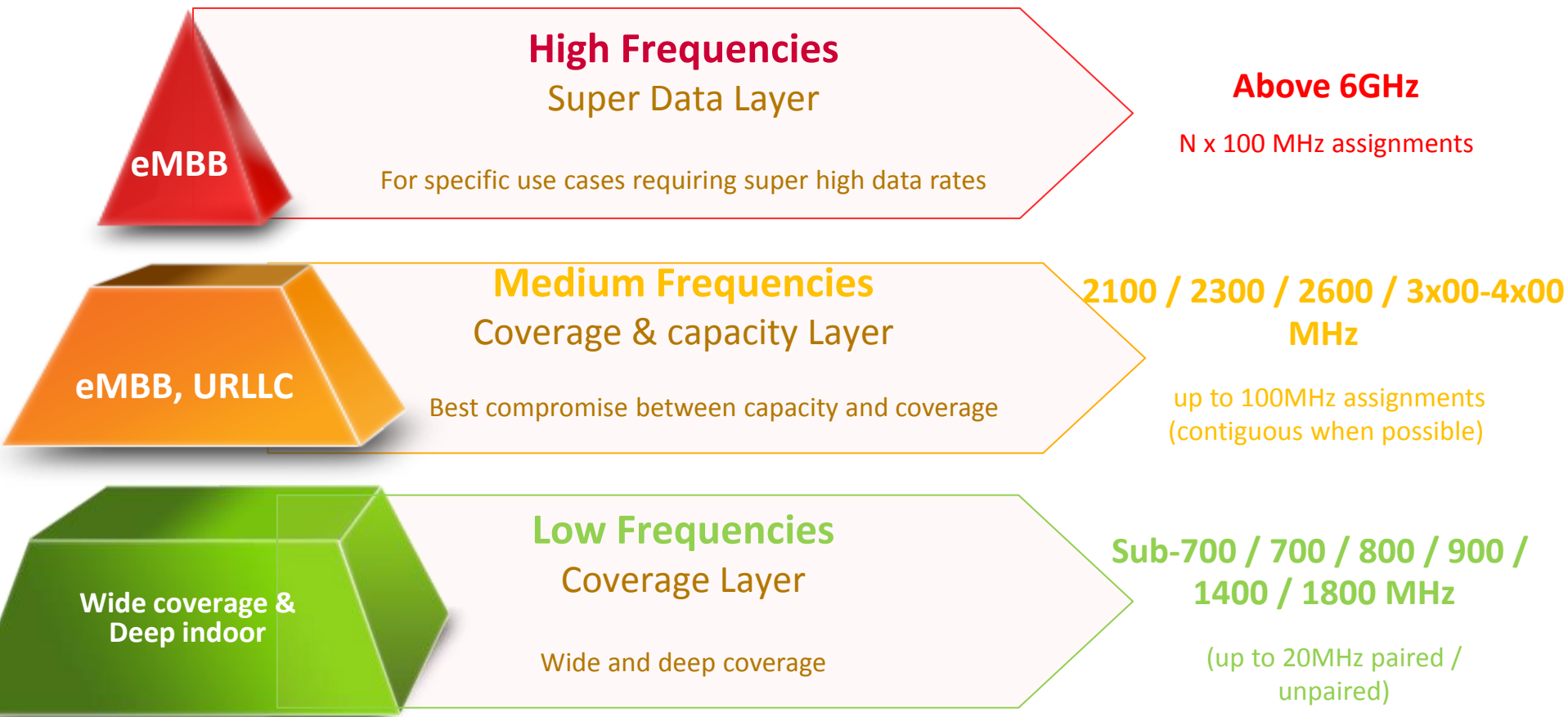


eHealth
e.g. Robotics, Remote surgery, Smarter
medication, Remote monitoring



Broadband access Everywhere
e.g. Last-mile Fiber in the Air (Fixed),
Extreme rural coverage for low density

Multi-frequency approach to address IMT use cases



**Regulators to make spectrum available for IMT in the three layers in parallel.
Each MNO will identify its specific most suitable combination of bands.**

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WRC-15 Results for 470-960 MHz band



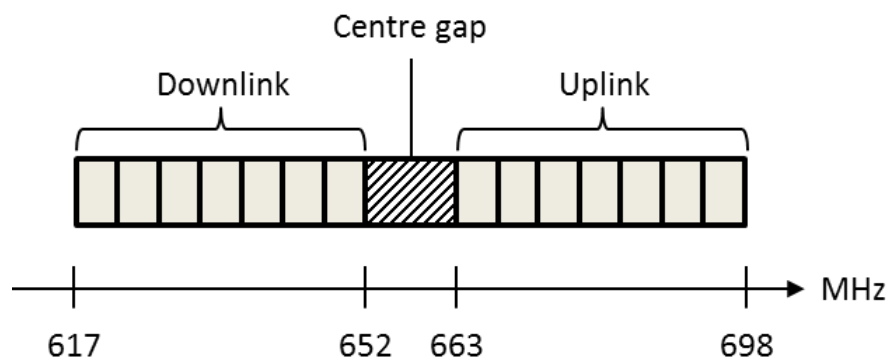
- **Region 2** (IMT identification):
 - 470-608 and 614-698 MHz: Bahamas, Barbados, Canada, Mexico, USA
 - 614-698 MHz: Belize, Colombia
- **Region 3** (IMT identification):
 - 470-698 MHz: Micronesia, the Solomon Islands, Tuvalu, Vanuatu
 - 610-698 MHz: Bangladesh, Maldives, New Zealand
- **Region 1** (in the preliminary agenda of WRC-2023):
 - Resolution 235: review in 470-960 MHz and possible regulatory action in 470-694 MHz



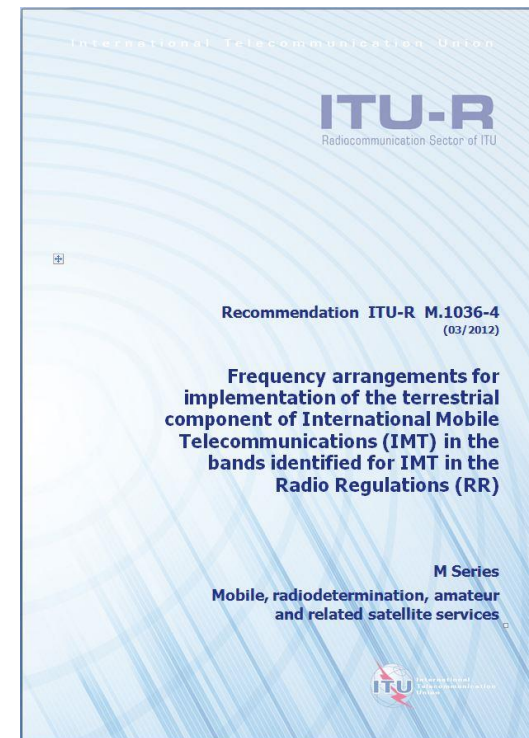
600 MHz: ITU-R progress

Recommendation ITU-R M.1036 on Frequency Arrangements for IMT:

- a new frequency arrangement for IMT in 600 MHz (Doc. 5D/[162](#), June 2016) was proposed to WP5D by **New Zealand, Mexico and Pacific Islands** (reverse FDD arrangement: 617-652 MHz / 663-698 MHz)
- **APT AWG/WG SPEC** proposed the same frequency arrangement to WP5D (Doc. [351](#), April 2017)
- The **US** arrangement for 614-698 MHz by FCC is identical



(draft) Frequency arrangement A12 (Section 2, Table 3 of draft Recommendation ITU-R M.1036-5)



600 MHz: Growing Momentum in the Market

The U.S. 600 MHz auction:

- Ended in April 2017 with 2x35 MHz reverse FDD frequency arrangement (617-652 MHz / 663-698 MHz)
- Major mobile vendors and chipset manufacturers have announced the plans to support 600 MHz (early 600 MHz smartphones are expected on the market as early as 2017)
- GSMA (over 800 members) strongly support making available 600 MHz for IMT* – global MNOs commitment!

Global footprint of 600 MHz interested countries is quickly growing:

- ❖ Argentina
- ❖ Bahamas
- ❖ Bangladesh
- ❖ Barbados
- ❖ Belize
- ❖ Canada
- ❖ Colombia
- ❖ India
- ❖ Maldives
- ❖ Mexico
- ❖ New Zealand
- ❖ Pakistan
- ❖ Solomon Islands
- ❖ Tuvalu
- ❖ U.S.
- ❖ Vanuatu



* according to www.gsma.com

Regional activities on 470-694/698 MHz:

EUROPE:

European Parliament and Council Decision on 470-790 MHz (doc [COM\(2016\) 43 final](#))

- does not limit the alternative usage of the 470-694 MHz band to downlink-only
- allows EU Member States to authorize alternative uses of the 470-694 MHz (Whereas 12, Art.4), such as *terrestrial wireless broadband* electronic communications services, but subject to “compatibility with national broadcasting needs” and protection of broadcasting services in neighbouring Member States (Whereas 6)
- includes (in Whereas 13) a variant of a European Review of the 470-694 MHz usage (presumably towards defining the European position on UHF at WRC-2023)



ASIA PACIFIC:

Draft new **Recommendation/Report on Frequency Arrangements for IMT in the band 470-698 MHz**
(doc [AWG-21/TMP-35 \(Rev.1\)](#) 3-7 April 2017, Bangkok, Thailand, 21st meeting of APT AWG)



AMERICAS: [“5G SPECTRUM RECOMMENDATIONS”](#) (by “5G Americas”, April 2017):



Harmonization of 5G Spectrum: “For spectrum policy, additional low-range spectrum (<3 GHz) is needed, with a particular focus on the 600 and 700 MHz bands.”

Bands below 1 GHz for IMT in Europe and CIS

■ 900 MHz (2x35 MHz)

- the band is used for GSM and UMTS in most European and CIS countries
- defragmentation of 900 MHz is required in many CIS countries to enable technology evolution

■ 800 MHz (2x30 MHz)

- the band is used for LTE in most European and some CIS countries

■ 700 MHz (2x30 MHz)

- the band is used in several countries of the APT region for LTE and will be available in most European countries around the year 2020, by the start of 5G mass-scale deployments worldwide
- an early availability of the band in Europe and CIS would enable MNOs to provide wide area 5G user experience, including IoT services, and support its commercial success

■ Sub-700 (potentially up to ~ 200 MHz)

- IMT identification in a number of countries in Regions 2 and 3 at WRC-15
- Europe to define its position on the co-primary allocation to the Mobile service and identification for IMT at WRC-2023

Existing IMT bands below 1 GHz (for coverage) are limited in bandwidth and will quickly run out of capacity \iff early planning is needed to enable the flexibility for countries to use part or the whole 470-694 MHz band for IMT

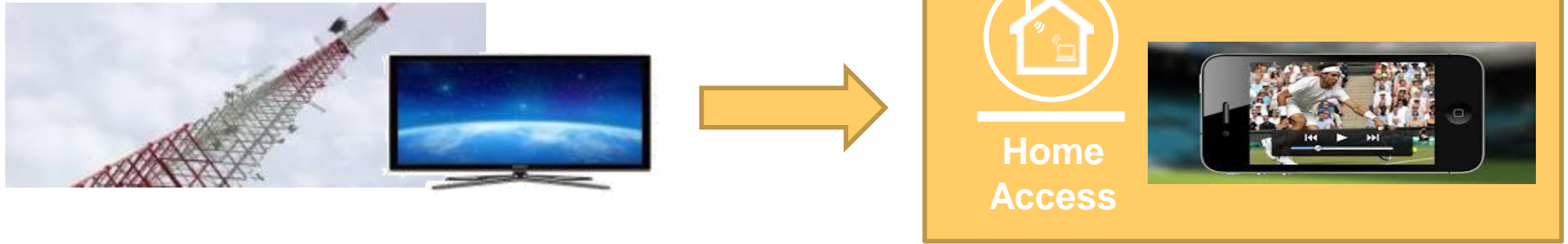


Spectrum **below 1GHz** can cost effectively address IMT use cases requiring wide and deep coverage (e.g. IoT, Last-mile Fiber in the Air, Rural use cases)

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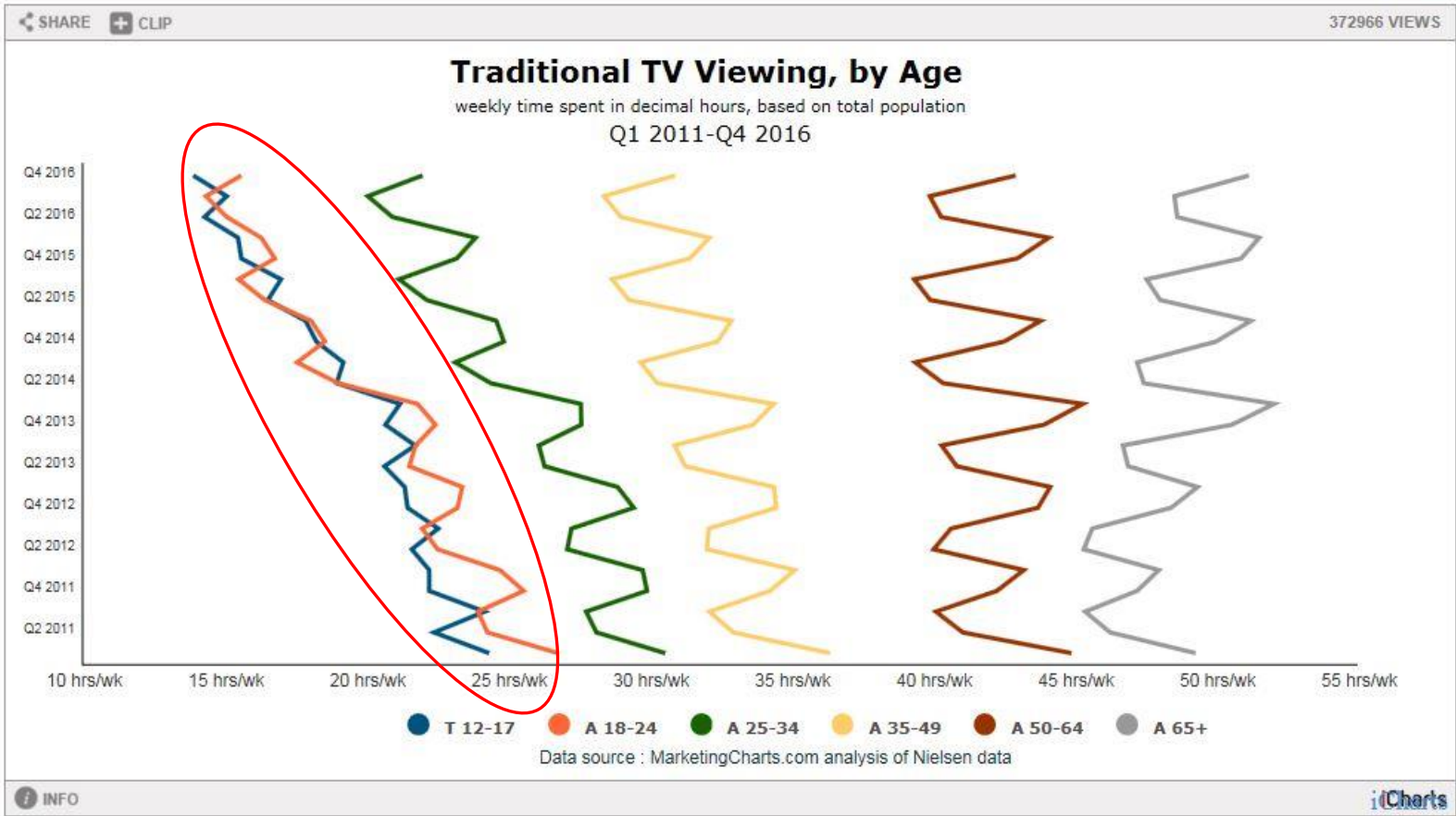
TV content consumption trend



- Video-on-demand services (such as Netflix, HBO, Viaplay, YouSee etc.) are quickly growing worldwide and changing the way of video content consumption (the share of individuals using video streaming services in e.g. Scandinavian countries is over 50%*)
- The vast majority of terrestrial TV consumers are watching only a limited number of channels ➡ a significant share of the UHF spectrum is underutilized

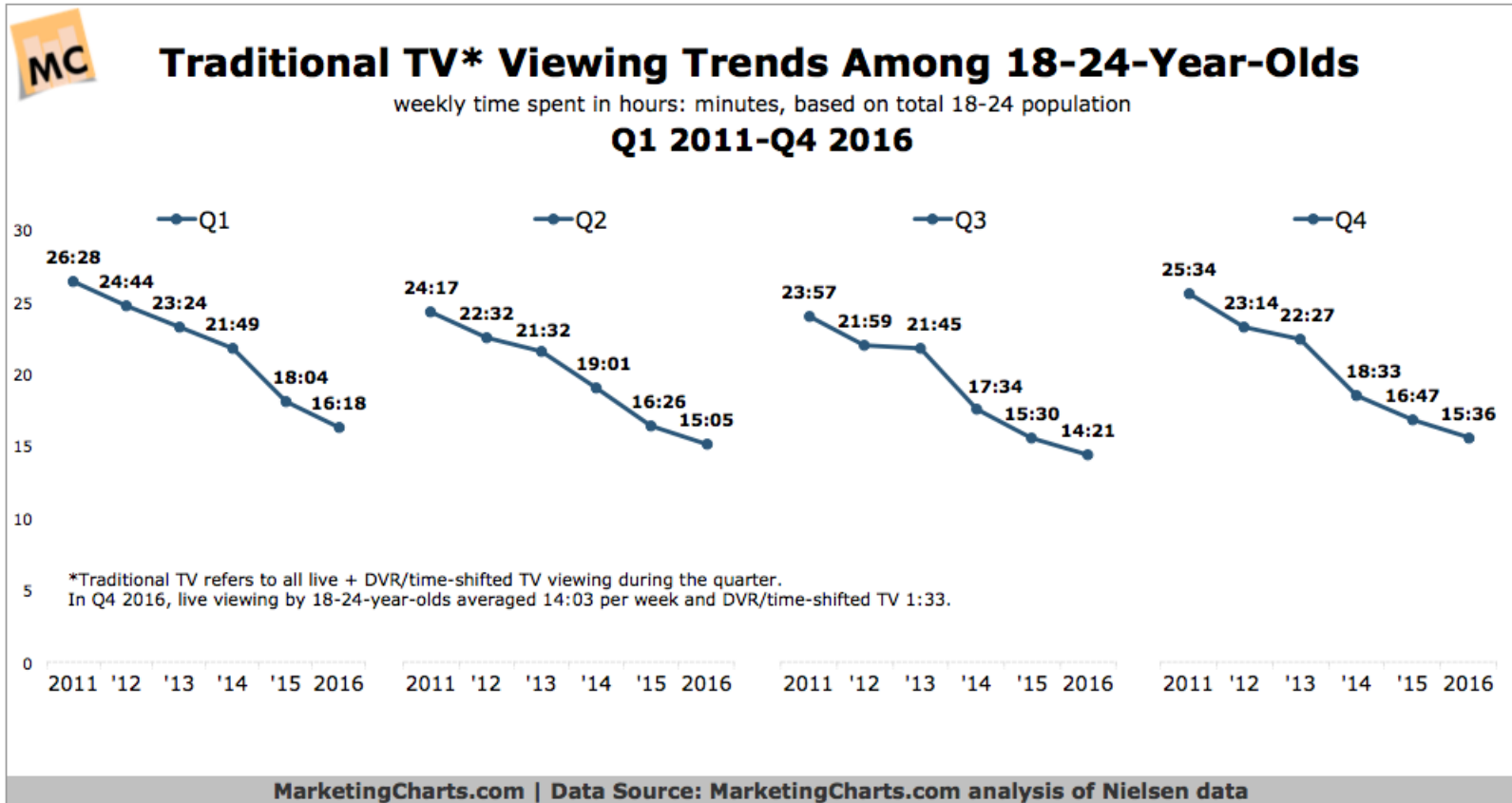
* according to www.statista.com

Traditional TV consumptions status (1)



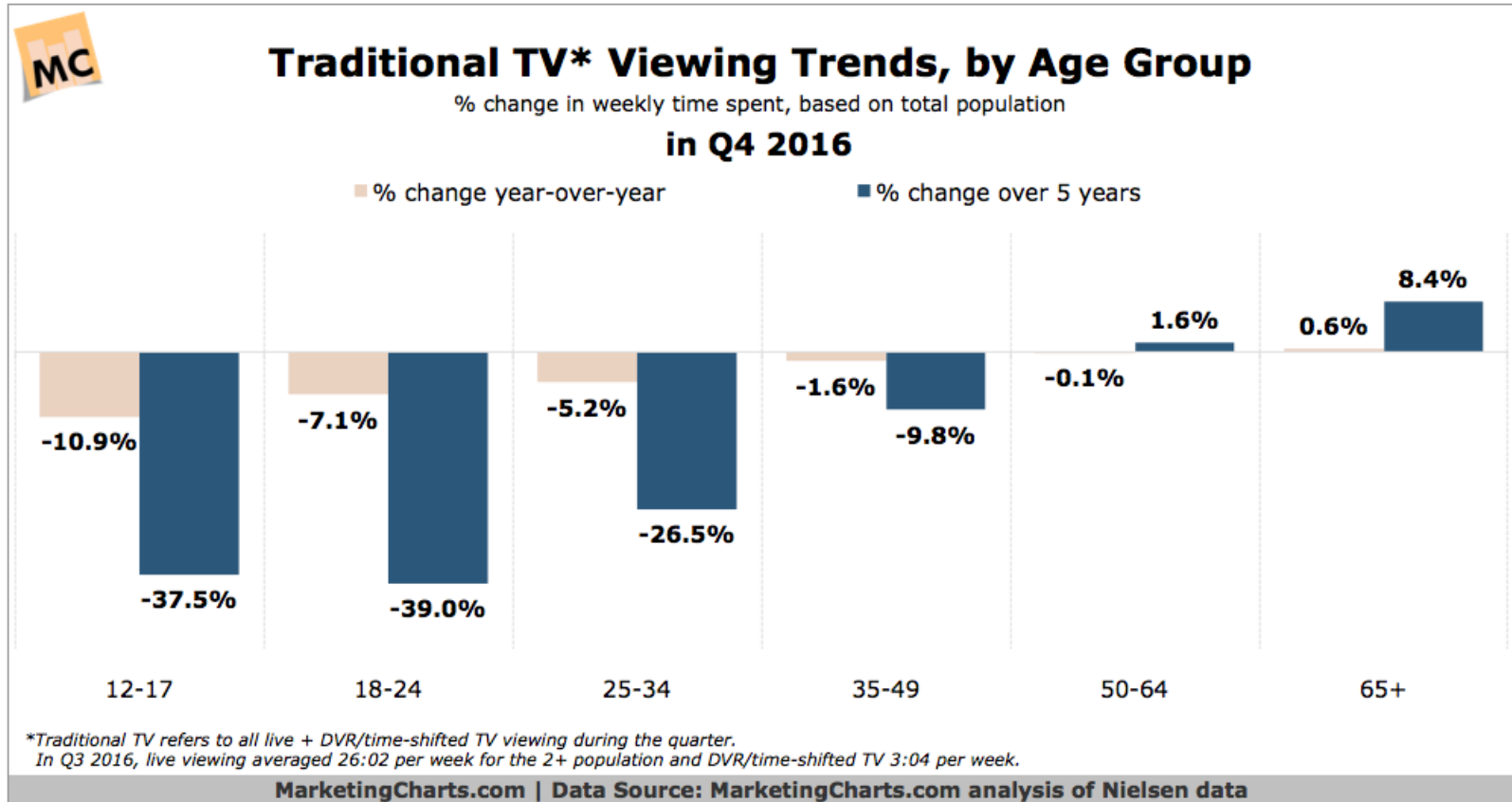
* according to [MarketingCharts](http://MarketingCharts.com) website

Traditional TV consumptions status (2)



* according to [MarketingCharts](http://MarketingCharts.com) website

Traditional TV consumptions status (3)



* according to [MarketingCharts](http://MarketingCharts.com) website

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Can DTT share the spectrum with mobile broadband?

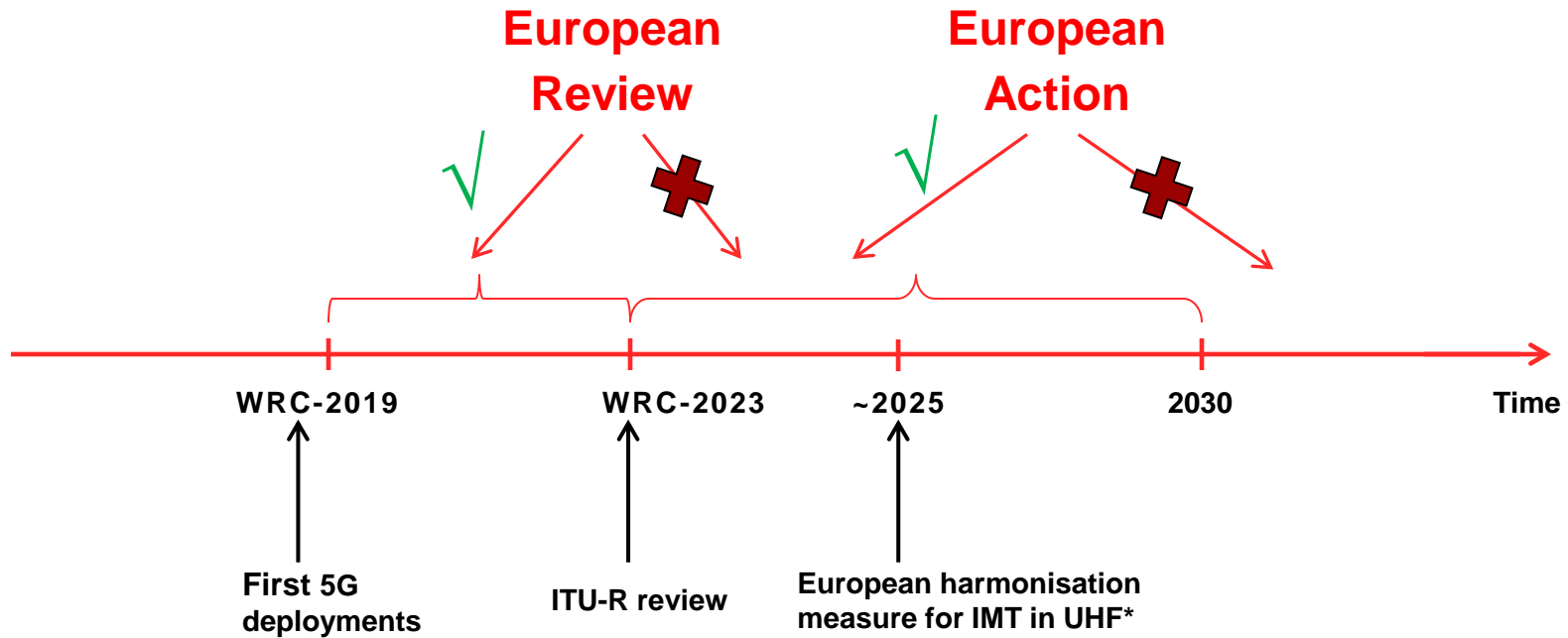
Based on the experience in the UK and US (where the sharing frameworks in UHF spectrum were introduced some years ago) and our technical analysis we are convinced that *spectrum sharing* between DTT and IMT (or other mobile broadband applications) would mean:

- within a country:
 - a) low-power national IMT deployments, or
 - b) geographically restricted IMT deployments, or
- across countries' borders:
 - a) geographically restricted IMT deployments

Huawei sees a harmonised repurposing the 470-694 MHz band for IMT after 2023 as the best scenario for Europe*

* this could be achieved via a co-primary allocation to the mobile service in Region 1 at WRC-2023 which will give the flexibility to the countries to open part of the whole UHF band for IMT when the national situation requires to do so

Repurposing 470-694 MHz for IMT – possible European Timeline



* differences in national timeframes for phasing out DTT will need to be addressed via appropriate *transitional arrangements*

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Huawei views on future use of UHF band in Europe

- Huawei notes the **constantly decreasing DTT consumption** in Europe while **IMT use cases** requiring wide and deep coverage (e.g. IoT, Last Mile Fiber in the Air, Rural) will continue to grow
- Huawei sees **a harmonised repurposing the 470-694 MHz band for IMT** after 2023 as the best scenario for Europe. This could be achieved via a **co-primary allocation to the mobile service in Region 1 at WRC-2023**
- Huawei notes that the alternative **DTT/IMT co-existence scenario** would require **severe power and geographical restrictions on IMT**, both within countries and along the borders with neighboring countries, and would thus lead to a **low spectrum efficiency**.

Thank you

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