I) Explain the demand for MFCN or WAS/RLAN in the upper 6GHz before and beyond 2030

APMS has previously already published their opinion regarding the future usage of the upper 6 GHz band.[1]

With the growing demand for mobile data consumption by the Czech population, the demand for greater use of other frequency bands for mobile services (MFCN) will also grow.

The best solution for the Czech Republic, after the approval of the strategic framework, seems to be a gradual (following the end of individual authorisations) migration of allocated fixed links to another band and thus ensuring support for the full development of MFCN networks in the upper 6 GHz band at the end of this decade.

Therefore, in Europe, the entire upper 6 GHz band (6425-7125 MHz) should be authorized for licensed use by macro-cellular mobile network deployments, noting that the lower 6 GHz band (5925-6425 MHz) is already assigned under a licence-exempt regime for use by WAS/RLAN[2] applications. Based on results of several researches the using the existing 2.4 GHz, 5 GHz, and lower 6 GHz bands Wi-Fi can consistently achieve Wi-Fi throughput levels which exceed 1 Gbit/s even in high-interference urban scenarios. [2]

The additional spectrum in the upper 6 GHz band (6425-7125 MHz) will need to address the service-impacting high traffic loads the 5G/5G-Advanced macro base stations in urban areas will experience, because data volumes carried by the mobile networks continue to grow at an annual rate of ~25%-30%.

Moreover, 6 GHz band has potential to be used for the future 6G deployment. The successful launch of a competitive 6G in Europe that starts with access to the entire upper 6 GHz band would, in turn allow wider channel bandwidths, e.g. 200 MHz assignments per MNO in a harmonized, coordinated and timely manner across Europe to exploit economies of scale and facilitate cross-border interoperability. Considering the number of mobile operators in Czechia it is strongly recommended to keep the whole 700 MHz in the upper 6 GHz band (6425-7125 MHz) for mobile broadband traffic.

II) Provide information about the sustainability of the explained demand, especially the:

1. Environmental impact assessment

Regarding the environmental impact of the upper 6 GHz the dedicated study was done by the Analysys Mason consultants for the carbon footprint comparison of mobile networks with and without 6 GHz[3]. They concluded that allocating additional upper 6 GHz mid-band spectrum to mobile networks would reduce CO_2 emissions by eliminating the need for the many additional mobile transmitter sites which would otherwise be required to deliver the 5G/IMT-2020 data rate requirements in urban areas and as set out in the Digital Decade Policy Programme 2030 target that "all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G".

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[1] Future use of the 6 GHz band - APMS

[2] Recent Wi-Fi field measurements have shown that by using the existing 2.4 GHz, 5 GHz, and Lower 6 GHz bands Wi-Fi can consistently achieve throughputs which readily exceed 1 Gbit/s even in high-interference urban scenarios, and can thereby meet the European Union's Digital Decade Policy Programme 2030 target that "end-users should be able to use gigabit services provided by networks at a fixed location deployed up to the network termination point"

[3] https://www.analysysmason.com/contentassets/7fc3f228704a4f0697716fc0555a85c6/impact-of-upper-midband-on-carbon-footprint-of-5g---final-report-020623.pdf

2. Social economic impact

The GSMA study is one of the most extensive (62 pages) [4].The basis is a cost-benefit analysis of socio-economic benefits in two demand scenarios (apartment houses, separate houses). why, in their view, it is optimal to allocate the entire 6 GHz band or most of it to IMT needs - in all the countries analysed, whether European or non-European; the allocation of part or whole spectrum has always resulted as the most socioeconomically profitable.

The analysis of GSMA indicates that the overall benefit from the release of mid-band spectrum (i.e. in the European case, mainly the 3400-3800 MHz spectrum and the potential future release of the upper part of the 6 GHz band) For IMT and for the prospective 5G and possible future generations of IMT technologies, the potential for total GDP in Europe in 2030 is 121 billion dollars, as a percentage of 0.38% of GDP.22

If we were to project this estimate into the Czech Republic, with a very conservative estimate of the average rate of economic growth of around 1.8% by 2030, this benefit of mid-band frequencies would contribute to GDP of around CZK 27 billion in the Czech Republic.

Depending on the market's characteristics and traffic growth, the additional spectrum in the upper 6 GHz will be used to address the service-impacting high traffic load that macro base stations are expected to experience in the 2027-2028 timeframe, facilitating the high-performance of 5G services and laying the foundation of 6G. As each new generation of mobile technology benefited of an initial deployment band, and taken into account the shortage of suitable spectrum for 6G early rollouts, a direct connection between 6G and the upper 6 GHz band has also been made. Independent reports, such as those from BIS Research, suggest that by 2035, the 6G market in Europe could be worth up to $240.02 billion[5]. However, upper 6 GHz alone will not be able to sustain such growth and spectrum from the 7.125-8.4 GHz is needed to be further studied for 6G.

III) Provide information about:

1. The possible role of the upper 6GHz for MFCN or WAS/RLAN

The upper 6 GHz band will be used as a capacity extension for other 5G bands.

The upper 6 GHz band has similar technical characteristics to C-Band (3.5 GHz) and can be used to effectively complement 3.5 GHz band.

As it was already mentioned, to support the future needs in the spectrum and taking into account the fact that lower 6 GHz band was already allocated for Wi-Fi services, the APMS recommend 700 MHz Upper 6 GHz band (6425-7125 MHz) for mobile broadband traffic.

2. Use cases, expected deployments (e.g. number of BS for MFCN) and timeframe

It is expected that upper 6 GHz will be required to support growing data consumption in mobile broadband by 2030. However, the first deployment can be expected earlier, depend on local situation and desire of mobile operators to test technology. Such deployments can be expected in late 2020s and firstly be supplementary for 3.5 GHz 5G base stations.

[4] https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2022/07/6-GHz-in-the-5G-Era.pdf

[5] https://www.globenewswire.com/news-release/2024/02/06/2824055/28124/en/Europe-6G-Market-Research-Report-2029-2035-European-Union-s-6G-Action-Plan-Aims-to-Secure-Europe-s-Leadership-in-Innovation.html

The upper 6 GHz band in the Czech Republic can respond to additional demand for spectrum in the middle band for 5G/6G because it has - as shown in the tests - similar propagation conditions to the 3400-3800 MHz band.

IV. Provide information about standardisation and technology impact

Upper 6 GHz has already been standardised for IMT, band id n104, with regulatory conditions agreed at WRC-23.

Upper 6GHz band (6425-7125 MHz) is in the medium to long term the only other perspective band for use by 5G and future generations of mobile networks and meeting the requirements of high capacity and data speeds and at the same time allowing effective base coverage At the same time, another IMT band with similar characteristics is not identified for the next decade.