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Concern : RSPG Consultation on upper 6 GHz band

1. Introduction

Hereby, POST Luxembourg would like to provide its contribution to RSPG's questionnaire on the long-term vision for the upper 6 GHz band. POST appreciates the opportunity to give feedback on this matter.

For easier reading, the present contribution is structured in the same manner as RSPG's questionnaire. Please note that POST does not provide incumbent services in the upper 6 GHz band and can therefore not contribute to section B.

2. POST responses to section A

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

With respect to MFCN, the upper 6 GHz band has similar, yet less good physical characteristics of as 3.6 GHz (most notably in terms of building penetration). In theory, it could serve for complementing current capacity.

However, POST considers that additional investments needed to deploy this band in a macro network are likely to be too high compared to the benefits to be reaped. Indeed, POST's current spectrum assignments can be complemented in a more cost-efficient manner by adding not yet assigned spectrum in the 2,6 GHz band. A deployment of the 6 GHz band, even if only in very densely populated areas, entails much more significant hardware swaps and thus significant CAPEX as the addition of supplemental 2,6 GHz.

In order to handle the constantly increasing traffic, POST considers other bands as more interesting, such as the 26 GHz band. Especially in high traffic areas, this band will add significant capacity and will allow to maintain a high-quality network.

It should however be noted that the upper 6 GHz band might become of interest when the process of IMT-2030 systems standardisation evolves.

With respect to WAS/RLAN, the 6 GHz appears as most promising for Wi-Fi usage for which standards are to evolve in the upcoming years towards ever increasing bandwidth and higher performance. Future Wi-Fi standards are set to allow for a significantly higher number of connected devices and to offer better in-building coverage as mobile networks using mmWave spectrum could. To do so, it is advocated that Wi-Fi needs to expand to the upper part of the 6 GHz band, alongside with the lower part of the 6 GHz it already uses[1].

On a final note, POST considers that campus networks will most likely rely on existing spectrum, or alternatively on other 5G pioneer bands, such as 26 GHz.

A.II. Provide information about the sustainability of the above explained demand, especially the:

A.II.1. Environmental impact assessment

In terms of physical footprint, and under the assumption that the 6 GHz were to be deployed in a macro network, the impact depends on whether this band can be integrated with other mid-band antennas or if supplemental antennas are needed. In the latter case, the footprint of a mobile network would evidently increase, yielding thus a negative impact.

At first sight, there seems to be only a reduced (if not inexistent) impact in terms of physical footprint in the scenario where the upper 6 GHz band was used for Wi-Fi.

In terms of waste management, the need for new Wi-Fi routers that are able to use the upper 6 GHz band might have a negative impact, since "simple" refurbishment of existing routers is not feasible.

As for energy consumption, usage of 6 GHz band in MFCN mode does currently not allow for a realistic assessment.

In the Wi-Fi scenario, it is noted that in principle, the most recent and upcoming Wi-Fi standards include power saving features, such as TWT (*Target Wake Time technology*). This feature extends battery life by allowing devices (i.e., routers) to control when and how frequently they wake up to receive and send data while preventing network congestion. These standards therefore allow also more energy efficiency in the network because they are not demanding unnecessary data traffic[2].

Another potential benefit resides in the fact that the more devices may connect to Wi-Fi, the more traffic is offloaded from mobile networks, which in turn can have a potentially positive impact on energy consumption of mobile networks.

[1] CF. Report "Wi-Fi Spectrum Requirements" from Wi-Fi Alliance: link to file Wi-Fi® Spectrum Requirements
[2] Yet, the overall energy need also depends on the number of connected end user devices.

A.II.2. Social economic impact

This impact is likely to be higher in WAS/RLAN than in MFCN, due to less investment needs.

Furthermore, providing sufficient capacity to Wi-Fi would also allow to reap maximum benefits from the existing and future fibre infrastructure, thereby potentially boost the future roll out and ultimately help to achieve the Digital Decade objectives.

Using the 6 GHz band in WAS/RLAN is likely to allow for a wider range of applications then the implementation in MCFN, reaching thus a larger number of users.

Social benefits are however largest if the 6 GHz bands remains unlicensed.

A.III. Provide information about:

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

To date, POST does not see any role for the upper 6 GHz band in the MFCN scenario and suggests keeping this part of the spectrum for Wi-Fi applications.

This assessment might however evolve with the IMT-2030 systems progress.

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

Currently, the only expected use case POST considers possible is the evolution Wi-Fi 8 and beyond.