Statement

Questionnaire on Long-term version for the upper 6 GHz band

Deutsche Glasfaser Group is a leading fibre broadband provider for rural and suburban areas in Germany. As a FTTH pioneer and industry leader, Deutsche Glasfaser plans, builds and operates open-access fibre networks for private households, businesses and public institutions. The company aims to roll out fibre networks across the nation, thereby contributing significantly to Germany's digital transformation. With innovative planning and construction methods, Deutsche Glasfaser is the technology leader for fast and cost-efficient FTTH deployment. Backed by experienced digital infrastructure investors EQT and OMERS, Deutsche Glasfaser is one of the financially strongest operators in the German market, with a planned total private-sector investment volume of EUR 7 billion.

Preliminary remark:

Thank you very much for the opportunity of commenting on the RSPG Subgroup Questionnaire "Long-term vision for the upper 6 GHz band". As leading fibre provider for rural and suburban areas, we recognize the critical importance of maintaining robust and reliable network services. The following outlines our perspective on the potential future usage of the upper 6GHz band for WAS/RLAN and its impact on our customers (e.g., retail and businesses, institutions, tourism).

A. Questions Directed to WAS/RLAN Stakeholders

I) Demand for WAS/RLAN in the Upper 6GHz Band Before and Beyond 2030:

Our primary focus is on ensuring that high-speed connectivity provided by our fibre network is fully realized at the end-user level. To achieve this, our customers, the citizens of the EU, rely on seamless integration with wireless technologies like Wi-Fi, which connect the final leg of the network to consumer devices.

In our view the demand for WAS/RLAN in the upper 6GHz band is projected to be significant both before and beyond 2030. This is driven by increasing reliance on high-speed internet connections facilitated by the widespread deployment of fibre networks, also in Germany. As of now, approximately 95% of the data traffic in Germany is transmitted via fixed networks, with end-user devices predominantly connected through Wi-Fi (compare Appendix).

The growing number of simultaneous device connections in environments such as homes, schools, universities and industrial facilities necessitates additional bandwidth, which can only be adequately provided by utilizing the upper 6GHz band. This band is crucial for enabling the full potential of new standard Wi-Fi 7, which supports multigigabit speeds and low latency, necessary for applications such as augmented and virtual reality (AR/VR).

II) Sustainability of Demand

1. **Environmental Impact Assessment:**

   The environmental impact of expanding WAS/RLAN in the upper 6GHz band is relatively low compared to other technologies. A combination of fibre and Wi-Fi is the connectivity option of choice for institutions, businesses and consumers because it is affordable, green and delivers unmatched performance. In addition, no external "investment decision" by a third party is necessary to provide wireless multi-gigabit connectivity at the premises is necessary. For example, FTTH access networks have been found to consume two and a half times less energy than current cellular/5G mobile networks.[1] WAS/RLAN operates on a license-exempt basis, promoting efficient frequency use with better batteries life of Wi-Fi devices. The implementation of Wi-Fi in the upper 6GHz band would support energy-efficient data transmission. More performant Wi-Fi will also hold reducing network roll-out costs and promoting the uptake of FTTH in the EU.

2. **Socio-Economic Impact:**

   The socio-economic impact of utilizing the upper 6GHz band for WAS/RLAN is substantial. The expansion of Wi-Fi 7 in this band would enable widespread access to high-speed internet, thus enhancing digital inclusion and supporting educational and business activities. The ability to provide multigigabit speeds through Wi-Fi ensures that investments in fiber networks reach their full potential, benefiting both public and private sectors.

III) Role of the Upper 6GHz Band and Expected Use Cases

1. **Role of the Upper 6GHz Band:**

   Wi-Fi technology serves as the crucial link, enabling fibre speeds to reach end-user devices—provided the necessary spectrum is available. The fully usable 6GHz band, combined with the Wi-Fi 7 standard, allows either many users to access gigabit speeds simultaneously or a smaller number of users to experience multigigabit speeds over three wide 320 MHz channels. The first option is vital for high-performance connections, such as those required for educational platforms or business applications. The second option is indispensable for latency-free, data-intensive applications in AR and VR, both in industrial settings and increasingly in private environments.

   However, with limited spectrum, the following occurs: the more devices (Wi-Fi clients) connect to a router (Wi-Fi access point) to send or receive data, the slower the transmission becomes. If too many clients use the same channel, they interfere with

[1] Köhn et al. (2020) and Nuutinen (2021). Current FTTH access networks have been found to be two and a half times more energy efficient than current cellular/5G mobile

each other. It is certain that the number of Wi-Fi clients, whether in schools or at home, will continue to rise sharply. Therefore, numerous available channels are essential. The wider the channel, the more transmission capacity it offers. The upper 6GHz band, for example, provides several 80 and 160 MHz channels.

Finally, Wi-Fi usage ensures highly efficient frequency utilization. While Wi-Fi allows every device in the network to connect, in mobile networks, only users with a contract can connect. Moreover, while important applications (e.g., smart home) enable data transport within a Wi-Fi network, mobile data must always route through the core network, even when devices are right next to each other.

2. **Use Cases and Expected Deployments:**

   Use cases for the upper 6GHz band include high-density environments like schools or universities, where multiple devices require simultaneous high-speed connections, and industrial settings, where low latency is critical for real-time applications. The expected timeframe for widespread deployment aligns with the rollout of Wi-Fi 7 technology, which is already in the market, with significant adoption anticipated before 2030.

IV) Standardization and Technology Impact

Wi-Fi 7, the latest Wi-Fi standard, is designed to operate across the entire 6GHz spectrum, including the upper 6GHz band. This standardization is crucial for ensuring interoperability and maximizing the performance benefits of the new frequency band. The ongoing development of Wi-Fi 7 and its deployment in consumer devices such as smartphones, tablets, and VR headsets indicate that the technology impact will be profound, driving the need for regulatory support to fully utilize the upper 6GHz band. Furthermore, installing a multigigabit Wi-Fi network is a decision by the end user/business and not by an operator, creating rapid deployment to support innovation. Therefore, Europe must encourage research in all technologies and promote a variety of business models, rather than promote an oligopoly centered on one technology.

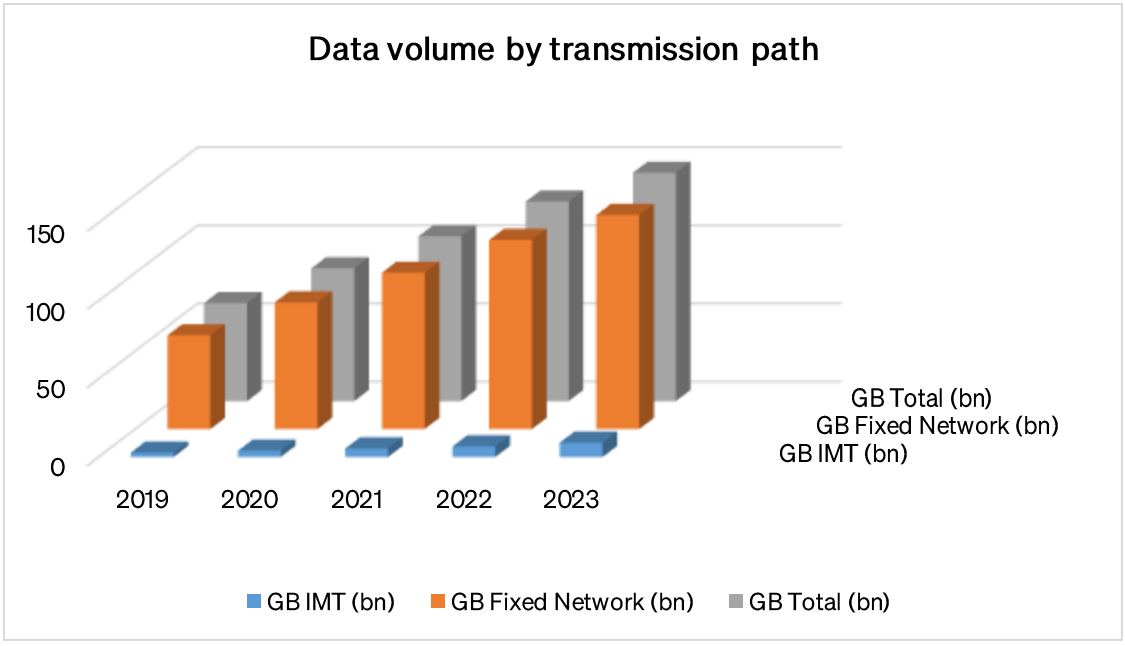
Conclusion

To secure connectivity for the gigabit and multi-gigabit society, regulatory frameworks must be established based on a careful assessment of societal costs and benefits, ensuring that Wi-Fi services, which are advantageous for all usage scenarios, function effectively for all users. Fibre providers and public authorities have invested billions over the years in fibre networks, especially in Germany, for participation in the global gigabit and multi-gigabit society. However, the impact of these substantial investment's risks being undermined if Wi-Fi connectivity by fibre users to their devices fails or is severely limited due to insufficient spectrum on the final stretch. This means, first and foremost, making sure that sufficient spectrum (which is a finite and scarce resource), including the upper 6GHz band, is allocated for licence-exempt use. This allocation will allow the latest generations of Wi-Fi technologies

Wi-Fi 7 and the future generations of Wi-Fi to deliver maximum benefits to Europeans, while preserving incumbent operations in the 6 GHz band.

Appendix:

Illustration 1) Data volume by transmission path[2] (Source: Federal Network Agency data portal)



[2] Based on data of Federal Network Agency (Germany), data portal (Access: 9th April 2024).