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February 26, 2024

Federal Office of Communications (OFCOM)
Networks and Services Section
Zukunftsstrasse 44
2501 Biel/Bienne

Re: Public consultation regarding the allocation of mobile radio frequencies available from 2029 for the provision of telecommunication services in Switzerland

Dear OFCOM -

The Dynamic Spectrum Alliance (DSA)[1] respectfully submits these comments in response to OFCOM's "Public consultation regarding the allocation of mobile radio frequencies available from 2029 for the provision of telecommunication services in Switzerland" (the Consultation). We appreciate the opportunity to offer our perspectives on how OFCOM can best prepare for the future allocation of frequencies for the provision of telecommunication services in Switzerland. The DSA and our members are available to discuss these comments and provide any additional information and insights on dynamic spectrum management and its role in increasing access to radio frequencies for the provision of a wide range of innovative wireless broadband services.

Respondent's details

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[1] The DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing. A full list of DSA members is available on the DSA's website at dynamicspetrumalliance.org/members.

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General questions

1. **How do you think the market will develop long term (mobile technology / applications / end devices / mobile traffic volume etc.)?**

The DSA anticipates that a combination of technologies, including 5G, fibre, satellite, and Wi-Fi, will all serve complementary roles to achieve digital transformation and increasing connectivity. Rather than promoting one technology over the other, the DSA and our members promote all technology solutions in so far as they serve targeted needs and are suited for specific use cases or applications. For example, Wi-Fi and fibre are generally best suited for indoor connectivity while 5G is the solution for connectivity on the go. That being said, there is an increased use of 5G technology to serve industrial user and enterprise local and indoor connectivity needs, typically through local or private networks, while many Wireless Internet Service Providers (WISPs) are using Wi-Fi outdoors to connect homes and businesses in rural, remote, and under-served areas.

As OFCOM considers its connectivity targets and the allocation of mobile radio frequencies to support them, the DSA urges OFCOM to consider the spectrum access needs of both mobile and fixed broadband networks as well as local and private use cases and applications. We note the difficulties that many service providers have historically had accessing spectrum on an affordable basis under traditional exclusively licensed approaches to support their broadband service offerings, particularly to unserved and/or under-served populations and areas. Additionally, private wireless users have been historically unable to access spectrum to support their particular use case and geographic requirements under traditional licensing approaches.

To meet the spectrum needs of these different types of users, the DSA encourages OFCOM and regulators worldwide to consider new and innovative approaches to spectrum management to increase spectrum access options and extend connectivity. Such innovative approaches include the adoption of new licensing frameworks that incorporate licensed, license-exempt, and license-by-rule (lightly-licensed) access options. In addition, the DSA promotes the use of automated dynamic spectrum management systems (DSMS) to make more efficient use of spectrum and support a wide range of commercial services, including wide-area mobile and fixed broadband networks, as well as local and private networks, use cases and applications. We believe that these concepts and tools should be key components of OFCOM's plans to make sufficient spectrum available in the future.

One application of DSMS that has been exceptionally successful at increasing access options for broadband (mobile and fixed) network operators, including private wireless network users, is the Citizens Broadband Radio Service (CBRS) shared access framework in the United States. The CBRS licensing model supports a wide range of new and expanded broadband services, including nationwide public mobile networks, multiple system operators (cable companies), rural WISPs, and a wide variety of private networks. The use of DSMS tools and this innovative licensing framework has spurred the deployment of hundreds of thousands of base stations and the introduction of new competitive service

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offerings that are making connectivity more affordable and accessible. The DSA encourages OFCOM to consider implementing DSMS and innovative licensing approaches for the mobile bands it is seeking to make available going forward.

Furthermore, the DSA urges OFCOM to consider the potential for a bottleneck to emerge in indoor connectivity if action is not taken to address the connectivity needs of both Wi-Fi and 5G. According to the conclusions of a DSA report on how Europeans connect to the internet,[2] the vast majority of data traffic in Europe is actually delivered over fixed networks. Mobile networks deliver traffic equivalent to 5% of the fixed network traffic, whereas Wi-Fi handles over 90% of fixed network traffic, i.e. the vast majority of internet traffic in Europe. These figures illustrate the paramount importance of Wi-Fi (non-cellular) technologies in the provision of telecommunications and digital services in Europe. The DSA recommends that OFCOM not overlook the need for license-exempt spectrum to support next-generation technologies and services.

4. **What is your view on the use of Fixed Wireless Access (FWA)[3] and which frequencies do you consider to be fundamentally appropriate? And which one are particularly well suited?**

As mentioned above, the DSA encourages OFCOM to consider the spectrum needs of both mobile and fixed services to meet the wide variety of emerging connectivity needs. FWA operators are increasingly using a combination of both 5G and Wi-Fi technologies to support their service offerings. The same is true for private wireless networks, which are predominantly fixed and/or local in nature. A common challenge both FWA service providers and private wireless users have is streamlined, low-cost access to spectrum. It is important that OFCOM ensures that there is sufficient spectrum for the latest generations of license-exempt technology, including Wi-Fi 6 and 7, and that lightly licensed access options are available for different FWA services. It also important to note that, like other access networks (e.g., DSL, fibre, cable, satellite), 5G FWA is typically terminated by customer premises equipment (CPE) that provides users with wireless indoor connectivity via Wi-Fi. For this reason, the DSA recommends OFCOM to consider frequency bands different from the 6425-7125 MHz band for FWA and to enable license-exempt access to this band.

Questions about the planned frequency allocation procedure in 2027

5. **What type of allocation procedure (auction, criteria-based allocation, direct allocation) should be used to allocate the frequency bands? Should all frequency bands be allocated using the same type of procedure?**

[2] DSA white paper "How do Europeans connect to the internet? 2022" https://dynamicspectrumalliance.org/wpcontent/uploads/2022/06/DSA-WhitePaper-How-do-Europeans-connect-to-the-Internet.pdf

[3] Wireless broadband coverage of households via the stationary use of outdoor antennas on buildings, from which signals are brought into the buildings via cable.

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As OFCOM considers the allocation procedures it intends to use in the future, the DSA recommends licensing approaches that will accommodate smaller service providers and industrial users in addition to traditional national mobile network operators. For example, the DSA supports tiered licensing approaches that offer multiple access options, such as the CBRS licensing framework, where incumbent users are given protection from two lower tier categories of new users that include nationwide mobile network operators, FWA providers, and a wide range of private wireless users:

> Tier 1 – **Incumbent users** operating in the band have the highest priority in accessing spectrum, with their access always guaranteed during their operations so that their radio equipment need not be aware of other operations sharing the band.
>
> Tier 2 – **Licensed new users** require a degree of certainty in accessing spectrum. To ensure sharing of the band with this tier of users, it is fundamental that the operation of incumbent services is well understood (e.g., operate only in certain areas) and is predictable (e.g., operate at certain times or otherwise offer information about when spectrum needs to be vacated). If such information is not accurate enough or unavailable, then access to the band for Tier 2 users might be greatly reduced or impossible. A use-or-share requirement for licensed spectrum is also important to ensure that spectrum use is maximized.
>
> Tier 3 – **Opportunistic users** can access spectrum on a license-exempt or licensed-by-rule basis. These users may not need access to spectrum over a larger geographic area, may be operating indoors or on a campus, or may be operating in more remote areas where spectrum usage will not be as competitive. In many cases, such networks are deployed in very remote areas where spectrum is largely unused and the risk of interference to higher-tier users is negligible. There might be other cases where there is sufficient spectrum available and the envisioned applications allow QoS flexibility, for example because the band is used to provide additional capacity to networks using other anchor frequencies. In such cases, it is conceivable to have a third tier of users with minimal regulatory barriers and no need for interference protection from other Tier 3 users.

As the CBRS experience has shown,[4] the use of DSMS tools and innovative licensing frameworks spur the introduction of new competitive service offerings and make connectivity more affordable and accessible.

[4] We call to OFCOM's attention the report issued by the U.S. Institute for Telecommunication Science (ITS), entitled "An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023."[4] This report shows that growth of access to the 3.5 GHz Citizens Broadband Radio Service (CBRS) has been strong, with a "mean quarterly increase of 12.0% and a total increase of 121% over the 21-month analysis period."[4] ITS notes that the majority of these deployments use spectrum in the CBRS licensed-by-rule General Authorized Access (GAA) tier, which does not require a user to apply for a license, but only to use certified equipment and to receive a spectrum assignment by one of the Spectrum Access System (SAS) administrators.

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Detailed questions on possible new frequency bands

6 GHz (Band 104)

35. **How do you rate the attractiveness and the economic and social benefits of this frequency band?**
36. **For which application and coverage scenarios are these frequencies suitable?**
37. **Do network equipment and terminal devices that can be used in this frequency range already exist? If not, when can they be expected?**
38. **What other aspects need to be considered in this frequency band?**

The DSA strongly supports the use of the entire 6 GHz band (5925-7125 MHz) for license-exempt low-power indoor (LPI) operations, very low power (VLP) indoor / outdoor operations, and standard power (SP) operations, the latter under control of an Automated Frequency Coordination (AFC) system.

Enabling license-exempt use across the entire 6 GHz band allows for near-term use of the latest generation of Wi-Fi and 5G NR-U standards to employ multiple high bandwidth 160 MHz and 320 MHz channels that support the channel diversity needed in dense deployments that exist both indoors and outdoors. With carefully crafted technical and operational conditions, these license-exempt operations can share the band with incumbent operations that include the fixed satellite service (FSS) and fixed service (FS).

The DSA notes that longer term use of the upper 6 GHz band (6425-7125 MHz) by wide-area IMT networks designed for outdoor and mobile operation, while possible, is not likely to offer a quality of service – especially in the uplink – sufficient to enable innovative services. IMT services would also require leveraging very high transmit power, increasing the energy consumptions of mobile networks. Finally, IMT deployment in the upper 6 GHz band is still many years away and will necessitate the development of coexistence mechanisms to share the 6425-7125 MHz band among 3GPP (and other) IMT technologies, IEEE-based Wi-Fi, and incumbent users. There is considerable work that needs to be done to fill in the details of the proposed high-level concept of sharing between license-exempt and licenced IMT services.

For example, it will be important that this work considers the different stages of ecosystem development for Wi-Fi and IMT in the 6 GHz band. In recognition of the fact that the Wi-Fi ecosystem has already developed for the entire 6 GHz band, the DSA encourages OFCOM to ensure that Switzerland can benefit from the full range of Wi-Fi 6E and Wi-Fi 7 device classes and connectivity without delay and without restrictions on the use cases licence-exempt technology can support. We recommend that OFCOM open the upper 6 GHz band to LPI and VLP devices immediately, while the necessary technical analysis and work starts on examining potential hybrid sharing schemes. While LPI devices could be affected by IMT devices operating outdoors, the reverse is not true. Thus, the

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regulatory risk for OFCOM to authorize LPI and VLP devices to operate today in the upper 6 GHz band is extremely low.

Respectfully submitted,

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