WBA Comments on Canada's ISED's Licence-Exempt Use in the 6 GHz Band (SMSE-014-20)

January 19, 2021

Table of Contents

Table of Contents

1. Introduction

Wireless Broadband Alliance (WBA) submits these comments in response to Canada's ISED's consultation on license-exempt use of the 6 GHz Band. WBA applauds and strongly supports ISED's consideration of license-exempt use of the entire 6 GHz band (5925-7125MHz).

WBA's mission is to enable collaboration between service providers, technology companies and organizations to achieve broad technology adoption by showcasing user benefits and by supplementing with specifications to enable widespread technology adoption.[1] WBA's membership is comprised of major operators and leading technology companies.[2]

WBA believes that the opening of the 6 GHz band for Wi-Fi 6E (and soon Wi-Fi 7) is critical for enabling 5G services that require high throughput and low latency. With the whole 6 GHz band, 80-, 160-, and soon 320 MHz wireless operations will become mainstream in the home, enterprise, and within venues. This will allow application providers to deliver new advanced wireless services that will generate new business opportunities within Canada.

WBA conducted a members-survey on the importance of Wi-Fi 6 E, and about 72% stated that 6 GHz license exempt access is critical or very important to their Wi-Fi business- and 40% say the new spectrum will expedite their overall roll-out and expansion of their networks. Obtaining the 6 GHz band globally was the second highest priority for WBA members, 62% rated additional allocation of 6 GHz spectrum as a very important regulatory issue for their

[1] https://wballiance.com/openroaming/

[2] Complete list of WBA members: http://www.wballiance.com/join-us/current-members/

business - only communications security and privacy was rated to be more important.[3] The report offers strong evidence that Wi-Fi, if not dominant, is a critical component in ensuring reliable access for important and emerging use cases. Adopting rules that unlock the full potential of the entire 6 GHz band to fuel the current and next-generation Wi-Fi will help ensure that the wireless connection to user equipment does not become the bottle neck in delivering 5G services

Wi-Fi is indispensable, carrying more than half of the Internet's overall traffic today, and the recent pandemic has shown that Wi-Fi is more important than ever to ensuring that consumers are connected. In addition, more than 70% of the data traffic on our smartphones are offloaded to Wi-Fi.[4] This offloading is expected to be extended with introduction of 5G. Cisco study expects this 5G adoption to speed up because of expansion of license-exempt band for Wi-Fi use. The next generation of Wi-Fi is a critical component to that. Wi-Fi 6E will enable even faster speeds and offer better performance for connected devices directly addressing ISED's stated objective of maximizing economic and social benefits that Canadians derive from the use of radio spectrum frequency resource.[5]

2. Wi-Fi 6E Equipment Availability

On the equipment availability, US FCC has already issued draft KDB Guidance[6] for testing of Wi-Fi 6GHz LPI devices (Phase 1) over the entire 1200 MHz band to be followed by

[3] WBA Survey, https://wballiance.com/resource/ran-convergence-paper-by-wba-and-ngmn-alliance/section 7.1.6 for more on 6 GHz
[4] Cisco, <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf>, pp. 24–25 - April 2020
[5] ISED SMSE-014-20
[6] FCC Publication Number: 987594
https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=277034&switch=P

testing of Automated Frequency Coordination (AFC) enabled devices (Phase 2). Similarly, in Europe, with the 6GHz ruling expected to be finalized by EC in May 2021, the European certification process of products are expected to start in early 2021 when ETSI standardization is expected to be stable and Notified Body process can be implemented.

License exempt Wi-Fi 6E devices are already being launched. ASUS, Netgear, Linksys, and TP-Link have announced Wi-Fi 6E access points.[7] Samsung just recently announced their latest phone model Galaxy S21 with Wi-Fi 6E support.[8] Intel has announced an update to its vPro platform which will bring Wi-Fi 6E to laptop computers.[9] The Wi-Fi Alliance reported that its member companies are demonstrating the readiness to move quickly into the band before the end of the year; an initial projection is that more than 300 million Wi-Fi 6E devices will enter the market in 2021.[10] We urge ISED to capitalize on this momentum and permit the Canadian consumers to begin enjoying the benefits of Wi-Fi 6E by granting license-exempt use of the entire 6 GHZ band (5925–7125 MHz).

3. License-exempt Designation for the Entire 6GHz Band (5925-7125MHz)

Wi-Fi Alliance, in its spectrum need study conducted in 2017[11] concluded that up to 1 GHz of new spectrum will be needed in 2025 to satisfy the anticipated busy hour, with between

[7] XDA News, These are the Wi-Fi 6e routers announced at CES 2021, https://www.xda-developers.com/these-are-the-wifi-6e-routers-announced-at-ces-2021/, 13 January 2021

[8] Samsung GS21 launch, https://www.theverge.com/2021/1/14/22227561/samsung-galaxy-s21-event-news-announcements-biggest-products-unpacked - 14 January 2021

[9] Wi-Fi Now, CES: Intel debuts Wi-Fi 6E on vPro platform & CommScope expands SURFboard family, https://wifinowglobal.com/news-and-blog/ces-intel-debuts-wi-fi-6e-on-vpro-platform-commscope-expands-surfboard-family/ - 11 January 2021

[10] https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-delivers-more-value-from-wi-fi-in-6-ghz

[11] Wi-Fi Alliance, Spectrum Needs Study (2017). https://www.wi-fi.org/news-events/newsroom/additional-unlicensed-spectrum-needed-to-deliver-future-wi-fi-connectivity

1.3 and 1.7 GHz required if demand exceeds the busy hour prediction because of novel un-anticipated applications, or further concentration of traffic into fewer busy hours. The study also emphasized on the importance of sufficient spectrum to be assigned with sufficient contiguity to support 160 MHz channels as supported in Wi-Fi 6, or even 320 MHz channels that are contemplated for Wi-Fi 7. Forward-thinking spectrum regulation that allocates contiguous spectrum to accommodate multiple 160MHz and 320MHz channels will enable growth of Wi-Fi and the economic benefits associated with that.

Opening the full band for license-exempt operation will also help with spreading the RLAN radio energy throughout the 6GHz band, which will have beneficial effect of aiding coexistence with the incumbent services.

Since Wi-Fi equipment is already being designed to operate across the entire 6 GHz band, Canadians can obtain the benefit of a large common market for equipment, which will help drive down costs.

Finally, license-exempt devices, such as Wi-Fi can coexist with incumbents throughout the band, and such incumbent operations will be able to grow as further described below. Furthermore, there are no realistic alternative uses for the 6 GHz band. Some claim that a portion of the band should be set aside for IMT, but the WBA does not believe this is practical. IMT coexistence with current 6 GHz incumbents would be very difficult. To enable IMT, administrations would either need to authorize power levels that are too low to substantiate licensed investment, or relocate the important incumbent services already operating in the band, which is not something that can be easily achieved anytime in the next ten years.

Based on the arguments listed in this section, WBA supports and strongly recommends opening the entire 6GHz (5925-7125MHz) band for license-exempt operation of Low Power Indoor (LPI) devices, Very Low Power (VLP) devices and Standard Power (SP) devices under control of AFC System. Additionally, WBA strongly urges ISED to consider direct client to client communications.

Speedy completion of the ISED proceeding for license-exempt designation of the 6GHz band, will be key in deployment of Wi-Fi 6E in Canada aligned with deployment of the technology in advanced countries in 2021.

4. Coexistence with Fixed Satellite Services and Fixed Service is possible with the right regulatory framework

Studies conducted in US, EU and other regions have already concluded that the co-existing of indoor and outdoor Wi-Fi services and devices with incumbent Fixed Services and Fixed Satellite Services can be achieved by limiting the transmit power of Wi-Fi devices and other co-existence mechanisms.

More specifically, studies conducted[12] in conjunction with the US FCC 6GHz proceeding concluded that the resulting aggregate interference into Earth to Space receivers at no higher than -20 dB I/N and as the result, the FCC Commission[13] concluded that the there is no need for frequency coordination for co-existence fixed Earth to Space Satellite services and co-

[12] RKF report (commissioned by 6 GHz Unlicensed Coalition (6USC) or the RLAN Group, detailed report from 2018): https://s3.amazonaws.com/rkfengineering-web/6USC+Report+Release+-+24Jan2018.pdf

[13] FCC 20-51A1, Unlicensed Use of the 6 GHz Band, Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295; GN Docket No. 17-183, April 24, 2020 https://s3.amazonaws.com/public-inspection.federalregister.gov/2020-11236.pdf

existence between indoor and outdoor Wi-Fi services can be achieved throughout the 5925-7125MHz band. The Commission noted that incumbent operations are limited to Earth to Space transmissions, and that the signal levels from Standard Power license-exempt devices at geosynchronous space station receivers would be so low as to have no or only a negligible effect on them. Out of abundance of caution, FCC adopted a restriction on radiation mask for license-exempt Standard Power access point to prevent them from pointing toward the space station receivers. Canada may adopt similar regulations.

With regards to the Low Power Indoor operation of Wi-Fi, a number of studies conducted in US and EU[14] concluded that, considering the attenuation of Wi-Fi signal due to Building Entry Loss, co-existence of indoor Wi-Fi devices is archived through restriction on transmit power of the indoor devices. As the result, US FCC opened the entire 6 GHz band for license-exempt indoor use without the need for frequency coordination but adopted following restrictions designed to prevent harmful interference to incumbent Fixed Services. The restrictions are: (1) limited to indoor operation; (2) subject to low power operation at maximum 30 dBm EIRP (5dBm/MHz PSD EIRP) for APs and 24 dB EIRP (-1dBm/MHz PSD EIRP) for

[14] RKF report (commissioned by 6USC, detailed report from 2018): https://s3.amazonaws.com/rkfengineering-web/6USC+Report+Release+-+24Jan2018.pdf
ECC report 302 (CEPT report with multiple studies developed by European administrations and industry):https://www.ecodocdb.dk/download/cc03c766-35f8/ECC%20Report%20302.pdf
ECC report 316 (CEPT report with multiple studies developed by European administrations and industry, focuses on VLP and short term criteria): https://www.ecodocdb.dk/download/8951af9e-1932/ECC%20Report%20316.pdf
6USC Group Fixed Link Interference Testing:https://ecfsapi.fcc.gov/file/108230735019254/6GHz%20FS%20coexistence%20study%20ex%20parte%20(final).pdf
6USC Comments to NPRM (outdated but good information):https://ecfsapi.fcc.gov/file/10216633127609/6%20GHz%20RLAN%20Group%20Comments%20(Feb%2015%202019).pdf
Summary of 6USC position (before R&O):https://ecfsapi.fcc.gov/file/1031999525288/AFC%20Ex%20Parte%20(Mar%2019%202020).pdf

Clients. Although FCC requirement limits the LPI transmit power at 5dBm/MHz, the Commission seeks comment in its Further Notice[15] to allow low power indoor devices to operate at a higher power spectral density of 8 dBm/MHz with a maximum permissible EIRP of 33 dBm when a device uses a bandwidth of 320 megahertz in the entire band. CableLabs, Charter, and Comcast advocated permitting low-power license-exempt devices to operate using 8 dBm/MHz PSD EIRP as concluded in its study[16] that harmful interference will not occur to fixed microwave links at this power level.

US FCC concluded that an interference protection criteria of -6 dB I/N shall be used by AFC Systems to calculate the frequency availability to protect incumbent Fixed Services against interference from indoor and outdoor devices operating with maximum transmit power at 36 dBm EIRP for APs and 30 dBm EIRP for Clients. As transportable TV pick-up services currently do not operate in the 6875-6930 MHz range in Canada, WBA recommends authorizing Standard Power devices to operate in the entire 5925-6930MHz band under control of the AFC System.

Operation of Very Low Power devices is a subject of US FCC FNPRM[17] and is not finalized yet. However, strong technical arguments have been provided in this proceeding supporting the authorization of VLP devices.[18] These comments are consistent with the findings in the EU, UK and South Korea,[19] that have authorized this class of equipment and they have

[15] https://s3.amazonaws.com/public-inspection.federalregister.gov/2020-11236.pdf
[16] https://www.fcc.gov/ecfs/filing/1033043576413
[17] FCC 20-51A1, Unlicensed Use of the 6 GHz Band, Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295; GN Docket No. 17-183, April 24, 2020 https://s3.amazonaws.com/public-inspection.federalregister.gov/2020-11236.pdf
18 RKF report (commissioned by 6USC, studies VLP): https://rkfengineering-web.s3.amazonaws.com/RKF+VLP+Report+(final).pdf
6USC VLP Sharing Study: https://ecfsapi.fcc.gov/file/10702302769261/VLP%20Ex%20Parte_28June2019.pdf
6USC Comments to NPRM:https://ecfsapi.fcc.gov/file/10216633127609/6%20GHz%20RLAN%20Group%20Comments%20(Feb%2015%202019).pdf
[19] ECC report 302 (CEPT report with multiple studies developed by European administrations and industry):https://www.ecodocdb.dk/download/cc03c766-35f8/ECC%20Report%20302.pdf

determined that Very Low Power devices can operate indoors and outdoors at dBm EIRP without the risk of harmful interference.

5. Allowing access to the additional 100 MHz of spectrum in the 6425-6525 MHz sub-band for standard-power operation

As transportable TV pick-up services currently do not operate in either the 6425-6525 MHz or the 6875-6930 MHz ranges in Canada, WBA strongly recommends authorizing Standard Power devices to operate in the entire 5925-6930MHz band under control of the AFC System

6. Conclusion and Summary Recommendation

WBA strongly recommends immediate authorization for LPI and VLP operation throughout the 6 GHz band (5925-7125MHz). WBA also recommends authorization of Standard Power mode throughout the 6GHz band (5925-6930MHz) under the control of both a centralized or decentralized AFC System. WBA also recommends to ISED to authorize direct Client to Client operation throughout the 6GHz band.

WBA contact: contactus@wballiance.com

Useful Definitions

Term	Definition
6USC	6 GHz Unlicensed Coalition -- also called the RLAN Group (Radio LAN Group), is a coalition of organizations working towards a common goal of advocating for license-exempt use of the 6 GHz band

ECC report 316 (CEPT report with multiple studies developed by European administrations and industry, focuses on VLP and short term criteria): https://www.ecodocdb.dk/download/8951af9e-1932/ECC%20Report%20316.pdf
Improving spectrum access for Wi-Fi, Spectrum use in the 5 GHz and 6 GHz bands, Ofcom, July 24, 2020