Dynamic Spectrum Alliance Limited
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July 26, 2021

Communications and Information Technology Commission (CITC)
Al-Nakheel District
Prince Turki Bin Abdul Aziz I Street intersection with Imam Saud Bin Abdul Aziz Road
PO Box 75606, Riyadh 11588
Saudi Arabia

Spectrum.Strategy@citc.gov.sa

Re: DSA Comments to the Public Consultation on "Radio Spectrum Allocation and Use Regulation for WLAN Applications".

Dear Sir/Madam,

The Dynamic Spectrum Alliance (DSA[1]) respectfully submits its comments in response to the Public Consultation on "Radio Spectrum Allocation and Use Regulation for WLAN Applications".

The DSA welcomes the Communications and Information Technology Commission's efforts to achieve its vision and unlock the potential of radiocommunication in Saudi Arabia, in order to secure a smarter and safer future by managing spectrum effectively and efficiently. In that context, the allocation and use regulations that apply to the use of the WLAN frequency bands in the Kingdom of Saudi Arabia to enable sharing with other non-WLAN services is very important. The DSA applauds CITC for its leadership in International Telecommunication Union ("ITU") Region I by permitting license-exempt use across the entire 6 GHz band (5925-7125 MHz).

The DSA believes these actions are consistent with CITC's guiding principles of:

- Promoting release and utilization of spectrum for the wider benefit of The Kingdom;
- Permitting the technology neutral use of spectrum where this is technically feasible;
- Promote improved spectrum utilization, including the support of shared spectrum bands under appropriate technical conditions of use to ensure coexistence of services; and

will help to unlock the potential of radiocommunication in Saudi Arabia for a smarter and safer future.

[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 www.dynamicspectrumalliance.org/members

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In this spirit, the DSA offers the following comments:

Section #2	Response & Comment
Amend definition of WLAN.	WLAN: Communications networks that are used… Wi-Fi 6/6e, NR-U, and *Multi Gigabit Wireless Systems, including* WiGig technologies…. Reason: "Recommendation ITU-R M.2003-2 (01/2018) Multiple Gigabit Wireless Systems in frequencies around 60 GHz" provides a broader definition of the type of envisioned use cases.
Add a definition of WLAN Band Fixed Wireless Access.	WLAN Band Fixed Wireless Access: Fixed wireless links operated in a license-exempt or light-licensing manner for eligible users, in either a point-to-point or a point-to-multipoint mode under the appropriate regulatory framework. Reason: The definition is an attempt to capture the range of outdoor FWA use cases that may include Teragraph in the 57-71 GHz band and broadband access provided by Wireless Internet Service Provider in other bands.
Amend definition of Light Licensing.	• Registration of location of usage *of the base station or access point.* Reason: To clarify that the operators of client devices operating in spectrum bands operating under light licensing rules do not have to register their location.
Re-name Light Licensing	• Light Licensing through Registration Reason: To clarify that the mechanism for light licensing is through registration of the standard power access points with an automated frequency control system, rather than through other mechanisms such as site licenses.

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Provide a more precise definition of Transmit Power Control	TPC: Transmit Power Control is a feature that enables a WLAN device to dynamically switch between several transmission power levels in the data transmission process. Reason: The proposed modified definition describes what TPC is and how it operates.
Add a definition of Premises	Premises: A house or building, together with its land and outbuildings, occupied by a business or considered in an official context. Reason: For Lightly Licensed through Registration WLAN operations in enterprises, in addition to Wi-Fi access points attached to ceilings in office settings and on factory floors, common use cases include Wi-Fi facilitated loading dock operations, outdoor storage and assembly areas, and Wi-Fi enabled vehicles traveling between building on a campus or industrial facility.

Section #3.1	**Spectrum Access Mechanism**
Add a clarification to the spectrum access mechanism to make it consistent with the Note in Section 3.3	Users shall be permitted….Light Licensing through Registration regime, *"as determined by CITC" or "as appropriate"*. Reason: CITC will identify some, but not all WLAN bands for usage under Light Licensing through Registration. The sentence as currently drafted can be interpreted as meaning that users have the choice to operate either under License-Exempt or Light Licensing Rules in all WLAN License-Exempt Frequency Bands.

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Section #3.1			Table 1		
Frequency Band (MHz)	**Appropriate Standard**	**Environment**	**Primary Restriction**	**Maximum Radiated PSD (mW/MHz)**	**Maximum EIRP (mW)**
5925-7125	TBD	Indoor (Access Point)	~~TPC~~[a]	~~3.125~~ **10**[b]	1000
		Indoor (Client Device)	~~TPC~~[a]	~~3.125~~ **10**[c]	~~150~~ **250**[d]
		Outdoor (Very Low Power Device)	~~TPC~~[a]	~~0.3125~~	~~25~~ **50**[e]

Reasons:

a. Primary Restrictions: As a best practice, in the United States, TPC is not required for WLAN operations by indoor access points and client devices in the 5925-7125 MHz in order to protect incumbent operations. Most Very Low Power Devices use outdoors is envisioned to be in the form personal area networks that will operate at an average of 1.5-meter height above ground level and will typically be subject to significant body loss and clutter, which will attenuate the transmission.

b. Maximum Radiated PSD for Indoor Access Points: The DSA proposed value is consistent with that in ECC Decision (20)01, which specifies a value of 10 mW/MHz (10 dBm/MHz). The CEPT studies demonstrated that a WLAN device with a radiated PSD limit of 10 mW/MHz would allow WLAN coexistence with incumbent services.

c. Maximum Radiated PSD for Indoor Client Devices: The DSA proposed value is consistent with that in ECC Decision (20)01, which specifies a value of 10 mW/MHz (10 dBm/MHz). The CEPT studies demonstrated that a WLAN device with a radiated PSD limit of 10 mW/MHz would allow WLAN coexistence with incumbent services.

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d. Maximum EIRP Client Power: Under the 6 GHz regulations adopted in the United States, the EIRP limit for low power indoor client devices was set at 24 dBm (250 mW), which is 6 dBm below the EIRP limit of the low power indoor access point. Note the FCC in the United States is now considering increasing the low power indoor EIRP by 3 dB.[2] This will help make 6 GHz area coverage similar to legacy 5 GHz band, and is therefore important for user experience. Studies have already shown that this increase in EIRP will not adversely impact 6 GHz incumbent services.[3] e. Maximum EIRP for Very Low Power Devices: Wi-Fi 6e certified products are based on the IEEE 802.11ax standard and have a maximum channel bandwidth of 160 MHz. IEEE 802 group has begun work on the successor standard, 802.11be, that will feature 320 MHz channel sizes. The DSA suggests that CITC consider the approach that Brazil took in its 6 GHz rules for Very Low Power devices, where it set the Maximum EIRP limit at 50 mW (17 dBm) for a 320 MHz channel. For a 160 MHz channel size, the corresponding Maximum Radiated PSD limit is reduced by 3 dB to 14 dBm. At this time, the DSA is not taking a position on the PSD limit of the VLP category of devices.

Section #3.3	**Lightly Licensed Access for WLAN bands**
Expand the definition of Lightly Licensed through Registration Access	Aside for the license-exempt use…power restrictions). "Lightly Licensed through Registration standard power WLAN access points and clients shall be permitted across the entire 5925-7125 MHz range". "Alternatively, Lightly Licensed access through Registration for standard power WLAN access points and clients can be provided through a CITC certified and licensed automated frequency coordination database to ensure the protection of incumbent services." Reason: To advance the 4th generation of industrial revolution in The Kingdom, enterprises need access to multi-gigabit Wi-Fi. With typical frequency reuse, this

[2] https://s3.amazonaws.com/public-inspection.federalregister.gov/2020-11236.pdf.
[3] https://www.fcc.gov/ecfs/filing/1033043576413.

	means multiple 80 and 160 MHz channels are required. If Lightly Licensed through Registration use is permitted in only a portion of the 6 GHz band, while an improvement on the current situation, it prevents enterprises within the Kingdom that rely on outdoor Wi-Fi to live up to their full potential. Under the rules adopted in the United States and Canada, Standard Power access points and client devices can only access channels at their location through permission of a cloud-based automated frequency coordination (AFC) system. The AFC received a daily updated copy of all the information on protected incumbent services in the country from the regulation, receives geo-location information from the standard power access points and client devices, and applies a calculation engine based on the interference protection criteria, to provide a list of available 6 GHz channels for the WLAN devices at that location and the EIRP limit for each channel. CITC can implement a Light Licensing through Registration regime by licensing the certified AFC system providers as an alternative to site licensing, which is economically inefficient and administratively burdensome. Standard Power access points operating outdoors must incorporate an emissions mask that limits the radiation transmitted above 30 degrees to the horizon. This emission mask will be even more effective the closer the Standard Power device is to the equator.
Add Table 2 on the Proposed Technical Conditions to be applied to Standard Power WLANs Operating in the 5925-7125 MHz band	

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Frequency Band (MHz)	Appropriate Standard	Environment	Primary Restrictions	Maximum Radiated PSD (mW/MHz)	Maximum EIRP (mW)
5925-7125		Indoor & Outdoor (Standard Power Access Points)	Light Licensing or Automated Frequency Coordination	200	4000
		Indoor & Outdoor (Standard Power Client Devices)		50	1000

Section # 3.4			**Fixed Links**		
Add Table 3 on the Proposed Technical Conditions to be applied to WLAN Band Fixed Wireless Access Operating in the 5925-7125 MHz band					
Frequency Band (MHz)	**Appropriate Standard**	**Environment**	**Primary Restrictions**	**Maximum Radiated PSD (mW/MHz)**	**Maximum EIRP (mW)**
5925-7125		Outdoors (FWA Base Stations Operating in a point-to-multipoint mode)	Light Licensing or Automated Frequency Coordination	200	4000
		Outdoors (FWA Customer Premise Equipment		50	1000

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		operating in a point-to-multipoint mode)			

The DSA is available to discuss these comments and any additional requirement the Commission might have.

Respectfully submitted,

Martha SUAREZ
President
Dynamic Spectrum Alliance