Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Unlicensed Use of the 6 GHz Band	)	ET Docket No. 18-295
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183

VERIZON PETITION FOR RECONSIDERATION

I. INTRODUCTION.

Verizon operates wireless backhaul services across the nation using Fixed Service licenses in the 5.925-7.125 ("6 GHz") band, *and* we support the introduction of unlicensed devices in the band, subject to a robust interference protection regime like automated frequency coordination ("AFC"). By applying "positive control" to unlicensed operations, AFC can limit the risk of harmful interference to incumbents and enable more intensive use of the 6 GHz band, including integrating unlicensed spectrum into 5G networks. AFC should be the cornerstone for any unlicensed opportunities in the 6 GHz band.

To that end, we target one area for Commission action on reconsideration—allowing higher power for unlicensed standard-power access points already subject to AFC. The *Report and Order* recognizes that unlicensed operations in the 6 GHz band "are expected to work in concert with new licensed 5G services,"[1] but the power levels as adopted are not sufficient to integrate wideband 6 GHz unlicensed operations into 5G systems. The Commission should increase the maximum permitted EIRP in the U-NII-5 (5.925-6.425 GHz) and U-NII-7 (6.525-

[1] *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, WT Docket No. 18-295 & GN Docket No. 17-183, FCC 20-51, ¶ 1 (rel. Apr. 24, 2020) ("*Report and Order*"), *errata* (rel. May 15, 2020).

6.875 GHz) bands from 36 dBm to 42 dBm (with a corresponding increase in the maximum conducted power limit from 30 dBm to 36 dBm), while leaving unchanged the maximum power spectral density ("PSD") of 23 dBm/MHz.

Although our petition focuses only on AFC issues, we firmly endorse CTIA's petition seeking reconsideration of the decision not to pursue flexible-use licensing in the upper portion of the 6 GHz band. Pursuant to Section 1.429 of the Commission's rules, we ask the Commission to reconsider these matters and revise its rules in accordance with the recommendations below.

II. WITH A ROBUST AFC, THE FCC SHOULD ADOPT HIGHER POWER LIMITS THAT WILL BETTER ACCOMMODATE WIDE-BANDWIDTH TECHNOLOGIES AND ADVANCE 5G.

Our Comments in response to the *Notice* in this proceeding laid out the case for a higher power level for standard-power access points in the U-NII-5 and U-NII-7 bands, based on our conviction that AFC can protect incumbents and our belief in the opportunities for additional spectrum use at 6 GHz.[2] As we noted, "[b]ecause the AFC will know the location and operating parameters of the licensed operations it is required to protect, there is no need to restrict access points to extremely low power levels to avoid the threat of interference to other users (either licensed or unlicensed) in a shared band."[3] And with higher power, the Commission could enable unlicensed 6 GHz operations for wide-area deployments with larger throughput—and enhanced compatibility with 5G systems.[4] Others, including the RLAN community, made

[2] Comments of Verizon, ET Dkt. 18-295, at 10-11 (Feb. 15, 2019) (proposing a PSD limit of 50 dBm/20 MHz) ("Verizon Comments"); Reply Comments of Verizon, ET Dkt. 18-295, at 18-19 (Mar. 18, 2019) (same) ("Verizon Reply Comments").

[3] Verizon Comments at 10.

[4] *Id.* at 11.

similar calls for higher power for AFC-enabled standard-power access points.[5] But, aside from generic references to the record as a whole, the *Report and Order* did not reflect any consideration of higher power levels for standard-power operations.[6] Instead, it adopted the proposal from the *Notice*, *i.e.*, the same power limits as those in the U-NII-1 and U-NII-3 bands: a maximum EIRP of 36 dBm (*i.e.*, 30 dBm conducted power into a 6 dBi antenna), based on a PSD of 23 dBm/MHz EIRP. On reconsideration, the Commission should adopt higher power levels for standard-power operations subject to AFC.

Specifically, the Commission should increase the maximum permitted EIRP for U-NII-5 and U-NII-7 access points from 36 dBm to 42 dBm (with a corresponding increase in the maximum conducted power limit from 30 dBm to 36 dBm), but without changing the maximum PSD of 23 dBm/MHz.[7] This modification, under an AFC regime, will produce significant benefits without added risk of harmful interference.

First, the current power levels hinder the promise of unlicensed 6 GHz to advance 5G. For wireless providers, 5G New Radio—Unlicensed ("5G NR-U") offers great potential to work together with 5G to alleviate capacity constraints by integrating unlicensed spectrum into 5G networks.[8] 5G NR-U is especially attractive in areas with high capacity demand or where the

[5] A coalition including Apple, Broadcom, Cisco, Facebook and others requested that the Commission adopt a PSD limit of 27 dBm/MHz for standard-power AFC controlled equipment. Reply Comments of Apple Inc. et al., ET Dkt. 18-295, at 12 (Mar. 18, 2019).

[6] *Report and Order* ¶¶ 17, 22.

[7] Verizon also proposes no change to the Commission's rule requiring U-NII-5 and U-NII-7 standard-power access points to protect satellite systems by observing a 21 dBm EIRP limit above a 30 degree elevation angle. *Id.* ¶ 92.

[8] 5G NR-U is currently under development by the 3GPP Global Standards Body. *See, e.g.*, Sean Kinney, *5G NR in unlicensed spectrum (NR-U) part of 3GPP R16*, RCR Wireless News (Dec.

capacity of the licensed bands has been exhausted. Importantly, however, 5G NR-U will use wide-bandwidth channels (*e.g.*, 80 GHz, 100 GHz or even more), a critical point when considering what power limits are necessary to ensure that 5G NR-U or other wideband technologies can be efficiently deployed. But the existing limits on overall power tend to penalize wide-bandwidth technologies like 5G NR-U,[9] even though the *Report and Order* finds that unlicensed operations across the 6 GHz band "will help to secure U.S. leadership in the next generation of wireless services" and may serve to "complement new licensed 5G services.[10]

The Commission's 36 dBm EIRP limit does not optimize the opportunity to support 5G systems that use bandwidths of 80, 100 or even hundreds of megahertz. A 36 dBm power limit (with a 30 dBm conducted power limit) will unnecessarily relegate wideband systems to coverage areas substantially smaller than those of narrowband systems. In turn, this reduced coverage will make 5G NR-U deployments much more expensive for operators (who will be required to deploy additional small cells to achieve their desired service areas) and potentially less optimal for consumers (should coverage areas be constricted as a result).

Modifying the maximum permitted EIRP for standard-power operations from 36 dBm to 42 dBm (and increasing the maximum conducted power limit from 30 dBm to 36 dBm) will yield significant coverage benefits for 5G NR-U systems. Indeed, the 6 dB increase in EIRP *will double the linear coverage and quadruple the geographic area coverage achievable* (using free space path losses), as compared to deployments subject to the rules adopted in the *Report and*

18, 2019), https://www.rcrwireless.com/20191218/5g/5g-nr-u-synchronized-sharing-private-networks.

[9] Verizon Comments at 10-11; Verizon Reply Comments at 18-19.

[10] *Report and Order* ¶ 229.

Order. Moreover, this increase in EIRP would benefit multiple unlicensed technologies, including 5G-NR-U and Wi-Fi 6 alike.

Notably, we do not propose a change to the existing 23 dBm/MHz PSD limit and, because the average interference power per MHz would remain constant, our higher power proposal adds negligible risk to incumbent operations and/or other new users in this band. Incumbent services use narrower bandwidths as compared to the anticipated bandwidths for new unlicensed operations, so the power from the unlicensed devices will not be concentrated into the bandwidth of the narrower incumbent systems. Our proposal simply spreads the maximum permitted PSD over a wider bandwidth, allowing an increased EIRP without increasing the interference risk to incumbents.[11]

Moreover, any remaining concerns about interference will be ameliorated by a robust AFC mechanism for controlling unlicensed operations in a manner that fully protects licensed incumbents. This requires industry cooperation, and accordingly we support the Commission's call for multi-stakeholder work on AFC development.[12] This group should be an independently formed entity that, as the *Report and Order* observed, includes "representatives of unlicensed equipment manufacturers, equipment users and point-to-point microwave providers to develop additional procedures to resolve interference concerns."[13] We stand ready to participate and

[11] For example, were a 5G NR-U system to use 80 megahertz channels, the current maximum EIRP of 36 dBm would be distributed over the full 80 megahertz bandwidth, resulting in a PSD of 17 dBm/MHz (6 dB below the 23 dBm/MHz PSD limit). If the EIRP limit is increased 6 dB to 42 dBm as we have proposed, an 80 megahertz channel would remain compliant with the 23 dBm/MHz PSD limit and realize the coverage benefits described above without having to reduce total radiated power.

[12] *Report and Order* ¶ 84.

[13] *Id.*

provide technical resources to advance AFC. One issue for the multi-stakeholder initiative to address is the evolution of exclusion zones, beginning with "a conservative interference protection criterion"[14] and, through AFC learning and more refined analytical models based on additional empirical evidence, consideration of reducing the size of exclusion zones over time.

* * *

For the reasons set forth above, the Commission should take advantage of the flexibility afforded by AFC and increase its maximum power limit for standard-power access points in the U-NII-5 and U-NII-7 bands. This action will ensure that wide-bandwidth 6 GHz operations are not disadvantaged by artificially low power limits.

Respectfully submitted,

By: _____*/s/*_____

William H. Johnson
Of Counsel

Tamara L. Preiss
Patrick T. Welsh

VERIZON
1300 I Street, NW
Suite 500 East
Washington, DC 20005
(202) 515-2540

June 25, 2020

[14] *Id.* ¶ 35.