BELEIDSVOORNEMEN UITGIFTEBELEID 3,5 GHZ-BAND

Ministry of Economic Affairs 17 March 2019

Den Haag

The Netherlands

Response of Ruckus Networks, an ARRIS Company

Ruckus Networks is a leading provider of wireless infrastructure solutions. We are consistently ranked in the top three manufacturers of Enterprise and Carrier Wi-Fi solutions in both unit volumes and revenues. Ruckus Networks also has been, and continues to be, an active and leading participant in the realization of the innovative vision for the 3.5 GHz Citizens Broadband Radio Service (CBRS) in the United States. We are active in the Wireless Innovation Forum's (WInnForum) Spectrum Sharing Committee (SSC), serving on the Steering Group and chairing the CBSD Test Task Group within Working Group 4. Ruckus was a founding member of the CBRS Alliance, serves on the Board, currently fills the Presidency, and leads the In-Building Task Group. Ruckus was honored to receive the Federal Communications Commission's (FCC) first CBRS Device (CBSD) authorization on September 6, 2018 for our Q710 and Q910 small cell products. Ruckus has collaborated with our partners in The Netherlands to demonstrate our Private LTE solutions utilizing the local licensing opportunity that has been available from 3410-3800 MHz.

Ruckus is pleased to offer the following responses to the consultation:

Question 1:

Ruckus agrees with the Ministry's proposal to designate 3700-3800 MHz for local licensing. Other European countries such as Germany, Sweden, and Austria are considering similar approaches to this frequency range, with the German regulator confirming recently that they will begin making local licenses available in this band for industrial uses beginning in the 2nd half of 2019. More broadly this frequency range lies within the overall 3400-3800 MHz range, which has long been established as global LTE TDD bands (B42/B43) and more recently as 5G "Pioneer" bands in Europe. Also, the US' CBRS band is also located in the broader 3400-3800 MHz range. All of this activity has resulted in a large and growing ecosystem of equipment supporting these frequencies, from chipsets to infrastructure equipment (notably with a large amount of lower power small cell products) and client devices (including handsets, IoT modules, cameras, laptop modules, CPE gateways, and the like). This large and vibrant hardware ecosystem will result in mass market economics for products and solutions in these bands, which will foster wide adoption by a range of enterprise and industrial users.

Question 3:

While Ruckus commends the Ministry, with special acknowledgement to Mr. Peter Anker, for their innovative, first of its kind approach to local licensing of cellular-oriented frequencies, there is a concern that the manual coordination of these licenses on a first-come / first-served basis will not

scale as demand increases and will ultimately lead to inefficient spectrum utilization. This is especially the case if local licensing will be limited to the 100 MHz from 3700-3800 MHz, as we would anticipate some applications requesting as much as 80 MHz for a single deployment. We would encourage the Ministry to study the actual signal levels and interference potential of low power deployments, especially inbuilding deployments where Building Entry/Exit Losses (BEL) further mitigate the interference potential. Based on our experiences with over 30 trial deployments of CBRS Category A small cells (30 dBm/10 MHz), we expect that the Ministry's 10 km protection/coordination radius is overly conservative, and we have heard of at least one high-profile industrial applicant whose license request has been delayed due to an existing local licensee near the edge of this 10km protection contour.

Ruckus would also encourage the Ministry to evaluate the possibility of a dynamic sharing/coordination approach for these frequencies. Utilizing a geo-location database based on an established propagation model with inputs including clutter and incumbent operations, such a database could coordinate spectrum requests in a given area in near real-time. If demand exceeds the available spectrum in a given location, coexistence mechanisms are available that optimize concurrent operations by multiple parties in close proximity (in either adjacent or co-channel situations). A great deal of work on these types of issues has occurred in the WInnForum and the CBRS Alliance and could be adapted to meet the specific needs of localized operations in The Netherlands. We would also note that Ofcom UK has proposed a local licensing, lower power framework for the 3800-4200 MHz range, with a plan to initially manually coordinate the licenses while beginning to look at dynamic database coordination as a follow-on enhancement. If the Ministry were to pursue such a strategy, local licenses could continue to be granted in the 3700-3800 MHz range on a first-come/first-served basis, while the protection rules, implementation, testing, and certification of a dynamic database coordination system were underway.

Ruckus Networks would be pleased to provide any additional information that may be helpful. David Wright, Director of Regulatory Affairs for Ruckus and also President of the CBRS Alliance, will be speaking at an event in Amersfoort on 20 March (https://www.btg.org/agenda/themabijeenkomst-rollen-voor-nieuwe-en-derde-spelers/) and would be pleased to meet with the Ministry in conjunction with this trip.

The following resources may also be useful:

WInnForum Webinar on Baseline CBRS Standards

https://www.youtube.com/watch?v=pWqSpF69CtI

Webinar on Shared HNI/PLMN for Private and Neutral Host Networks

https://www.youtube.com/watch?time_continue=967&v=lD7Ge1Y7x3s

CBRS: Should the enterprise and venue owners care?

https://www.cbrsalliance.org/wp-content/uploads/2019/02/SenzaFili_CBRS_DeepDiveReport.pdf

Making Neutral Host a Reality with OnGo (CBRS)

https://www.cbrsalliance.org/wp-content/uploads/2018/12/ME-Neutral-Host-with-OnGo-WP-Final.pdf