

# Consultation on Uganda Communications Commission Guidelines for the Utilisation of the 5GHz Band for Wireless Access Networks in Uganda

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TO: The Executive Director  
Uganda Communications Commission  
UCC House, Plot 42-44, Spring Road, Bugolobi  
KAMPALA

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Dear Madam,

Thank you for the opportunity to provide commentary on the important topic of the use of 5GHz spectrum for Wireless Access Networks in Uganda. These comments were consolidated from **BOSCO**, **APC**, and **RENU**<sup>1</sup>. We applaud the leadership that UCC has shown in making 5GHz spectrum accessible on a license-exempt basis over the years and the responsiveness of this consultation to ensure that regulations governing the use of 5GHz spectrum on a license-exempt basis are consistent with technological developments as well as evolving regulations internationally. Here follow our comments on the Consultation Paper.

## General Remarks

License-exempt spectrum and, in particular the 5GHz range of license-exempt spectrum under consultation, has undergone profound changes in the last 15 years. Not only have WiFi technologies become ubiquitous in both public and commercial venues but WiFi has also evolved dramatically as a broadband Point to Point (PtP) and Point to Multipoint (PtMP) technology. Fixed wireless technologies using 5GHz license-exempt spectrum have gone from a few tens of megabits per second when first launched in 2008-2009 to now offering

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<sup>1</sup> More details regarding these organisations can be found at the end of the document

more than a gigabit per second<sup>2</sup> thanks to improvements in radio and antenna design and new technologies such as MIMO. Not only has 5GHz radio equipment become more efficient in its use of spectrum for PtP and PtMP use but it has also become more effective at managing interference.

As such, WiFi has proven itself as an ideal complementary technology to the spread of terrestrial fibre optic networks. WiFi can extend access from a fibre network Point of Presence at very low cost. This can have particular impact in rural areas where cost of infrastructure is a significant factor in sustainability. As a non-profit organisation offering services to people in Internally Displaced People's (IDP) camps in northern Uganda, BOSCO has been able to leverage the power and affordability of these WiFi bands to deliver access services where commercial operators are either non-existent or unaffordable.

Similarly, 5GHz license-exempt spectrum has been vital for RENU in assisting in the build-out of campus wireless networks at universities across Uganda, creating affordable high-speed broadband networks which are the sine qua non of modern universities. RENU has been able to roll-out metro eduroam, a WiFi service that enabled many students within the metro to access connectivity while their campuses were closed throughout Uganda's country-wide lockdown.

WiFi has also been a significant catalyst for a growing number of small commercial ISPs which have been able to take advantage of license-exempt technologies to grow a wireless access business without having to surmount the now significant financial barrier that access to IMT spectrum represents.

Indeed, 5GHz license-exempt radio equipment has become so effective and affordable for PtP links that even mobile network operators are choosing to replace some licensed microwave links with license-exempt technologies.

Because license-exempt spectrum does not generate direct revenues for the government in the manner that licensed spectrum auctions do, its economic value is often underrated. A recent study<sup>3</sup> published by the WiFi Alliance suggests that WiFi currently generates \$1 billion in economic value in Uganda and that it is on track to generate \$4 billion by 2025. However, that prediction is predicated on the assumption that UCC will establish regulations that permit operators to extract maximum value from license-exempt spectrum.

We encourage UCC to build on the success and impact of license-exempt 5GHz use by maximising its potential use for PtP and PtMP use and to encourage its uptake.

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<sup>2</sup> <https://www.ui.com/uisp/ptp-bridging>

<sup>3</sup> Economic value of Wi-Fi® forecast in Africa, Middle East, and India. 14 Sept 2021 WiFi Alliance [https://www.wi-fi.org/download.php?file=/sites/default/files/private/Global\\_Economic\\_Value\\_of\\_Wi-Fi\\_2021-2025\\_202109.pdf](https://www.wi-fi.org/download.php?file=/sites/default/files/private/Global_Economic_Value_of_Wi-Fi_2021-2025_202109.pdf)

## Specific Recommendations

- For 5150-5250 and 5250-5350 we would like to suggest that UCC retain at least 200mW EIRP for outdoor use. This is consistent with Nigeria<sup>4</sup> and Kenya<sup>5</sup> and also with WRC 2019<sup>6</sup>.
- For 5725-5825 we would like to propose that the maximum gain for PtP devices be raised to at least 200W as has been implemented in Argentina, South Africa<sup>7</sup>, the United States<sup>8</sup>, and New Zealand<sup>9</sup>. An even better option might be to set the gain for PtP devices in this frequency as unrestricted for PtP, as has been implemented in Nigeria<sup>10</sup> and Canada<sup>11</sup>.
- For 5725-5825 we would also like to propose that UCC consider removing the requirement of registration of devices in Category C. Given that the very nature of license-exempt spectrum entails no inherent protection from interference, we believe that the requirement of registration is only likely to add administrative burden to both regulator and operator without adding significant value.
- Further to the previous point, we propose that UCC encourage the formation of an industry association for license-exempt wireless service providers. This might be done by the provision of a seed grant through the universal service fund to kickstart an association. Industry associations such as WAPA in South Africa and WISPA in the United States have been successful in ensuring the healthy growth of license-exempt spectrum use by operators through:
  - Strong peer encouragement of adherence to regulated power restrictions and general homologation requirements;
  - Engaging in facilitated dispute resolution where issues of spectrum interference arise;
  - Building the technical capacity of operators through technical and safety training efforts; and,

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<sup>4</sup> Regulatory Guidelines For Deployment Of Broadband Services on the 5.2-5.9 GHz Band  
<https://www.ncc.gov.ng/docman-main/legal-regulatory/guidelines/59-guidelines-for-deployment-of-broadband-services-on-the-5-2-5-9ghz-band/file>

<sup>5</sup> Communications Authority of Kenya: Guidelines On The Use Of Radio Frequency Spectrum By Short Range Devices  
<https://www.ca.go.ke/wp-content/uploads/2018/02/Guidelines-on-the-Use-of-Short-Range-Devices-Revised-8th-July-2016-1.pdf>

<sup>6</sup> <https://www.icta.org/contentassets/d7e421981aa64169af1a8d6b37438d4d/wrc-2019-final-acts.pdf> page 343  
Resolution 229

<sup>7</sup> Ellipsis Regulatory Solutions: Licence exempt bands in South Africa which may be used for outdoor wireless access systems  
<https://www.ellipsis.co.za/wp-content/uploads/2013/10/Guide-to-commonly-used-licence-exempt-frequency-bands-May-2013.pdf>

<sup>8</sup> FCC Unlicensed National Information Infrastructure  
[https://en.wikipedia.org/wiki/Unlicensed\\_National\\_Information\\_Infrastructure](https://en.wikipedia.org/wiki/Unlicensed_National_Information_Infrastructure)

<sup>9</sup> GoWireless NZ Optimising your wireless link  
<https://help.gowifi.co.nz/support/solutions/articles/48000976640-optimising-your-wireless-link>

<sup>10</sup> See page 4 of Regulatory Guidelines For Deployment Of Broadband Services on the 5.2-5.9 GHz Band  
<https://www.ncc.gov.ng/docman-main/legal-regulatory/guidelines/59-guidelines-for-deployment-of-broadband-services-on-the-5-2-5-9ghz-band/file>

<sup>11</sup> Section 5.4e RSS-247 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices  
<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10971.html>

- Building a critical mass of expertise which can advise UCC on new technology developments that affect the use of unlicensed spectrum.
- We would also like to encourage UCC to actively explore the potential of additional frequencies for license-exempt use. This would revise 5GHz license-exemption upwards to include 5850-5925 GHz, as has been implemented in the United States<sup>12</sup> and elsewhere.
- Last but not least, we encourage UCC to expedite the adoption of 5925 - 6425 MHz for license-exempt use, consistent with ATU recommendation in July 2021<sup>13</sup>.

## About the submitting organisations

### **About Battery Operated System for Community Outreach (BOSCO)**

BOSCO Uganda<sup>14</sup> is a not-for-profit Organization (NPO) under the trusteeship of the Catholic Archdiocese of Gulu. BOSCO began in 2007 as an intervention to end isolation of people in the Internally Displaced People's (IDP) camps of northern Uganda in the aftermath of the Lord's Resistance Army war (1986-2007) by setting up ICT Centres in the camps to connect one camp to the other. BOSCO Uganda started its activities bringing Internet and Voice over Protocol (VoIP) telephony with the help of solar powered PCs to rural hard to reach areas of Northern Uganda. Since then, BOSCO Uganda is a leading NPO in the area of Information Communication Technology (ICT) and the only Community Network in Uganda.

The success of this initial project is one that has paved the way for the establishment of 55 community ICT & Development Centers in rural areas in Acholi, Lango and West Nile regions.

### **About the Association for Progressive Communications (APC)**

APC<sup>15</sup> is an international network of organisations that was founded in 1990 to provide communication infrastructure, including Internet-based applications, to groups and individuals who work for peace, human rights, protection of the environment, and sustainability. Pioneering the use of ICTs for civil society, especially in developing countries, APC members were often the first providers of Internet in their countries. APC continues to grow its worldwide network of NGOs which use the internet to make the world a better place. APC is both a network and an organisation, with UN ECOSOC status and ITU-D sector membership. APC members are groups working in their own countries to advance the same mission. APC has 58 organisational members and 28 individual members active in 74 countries.

<sup>12</sup> FACT SHEET\* Use of the 5.850-5.925 GHz Band Notice of Proposed Rulemaking – ET Docket No. 19-138  
<https://docs.fcc.gov/public/attachments/DOC-360940A1.pdf>

<sup>13</sup> [https://www.atuat.africa/wp-content/uploads/2021/08/En\\_ATU-R-Recommendation-005-0.pdf](https://www.atuat.africa/wp-content/uploads/2021/08/En_ATU-R-Recommendation-005-0.pdf)

<sup>14</sup> <https://boscouganda.com/who-we-are/>

<sup>15</sup> <https://www.apc.org/en/about>

## **About Research and Education Network for Uganda (RENU)**

RENU<sup>16</sup> is a not-for-profit National Research and Education Network (NREN) that offers affordable services uniquely designed to enable collaboration among its member institutions and their global partners. The network is a cooperatively owned and community-driven service provider that helps to facilitate research and education networking among its member institutions through interconnecting them with other research and education networks, as well as to the commercial Internet worldwide, thereby overcoming the traditionally high costs of information and knowledge sharing and exchange.

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<sup>16</sup> <https://renu.ac.ug/about.html>