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October 20, 2022

Department of Communications and Digital Technologies
First Floor, Block A2, iParioli Office Park, 1166 Park Street, Hatfield, Pretoria
South Africa
For attention: Mr T Ngobeni, Deputy Director-General, Infrastructure Support
via email: spectrumpolicy@dcdt.gov.za

Re: Consultation on draft Next Generation Spectrum Policy

Dear Sir/Madam,

The Dynamic Spectrum Alliance (DSA[1])) respectfully submits comments in response to the public consultation on South Africa's draft Next Generation Radio Frequency Spectrum Policy for Economic Development (Spectrum Policy), which was published in Government Gazette no. 46873 on 8 September 2022.

We appreciate the opportunity to participate with these comments to the definition of the Next Generation Radio Frequency Spectrum Policy ("Spectrum Policy"), that is used to coordinate national spectrum management approaches to support the rollout of communications networks for socio-economic national development.

Executive Summary

South Africa needs to maximize the use of radio spectrum to accelerate the rollout of affordable connectivity and harness the benefits of digitization in both urban and rural areas. If large amounts of spectrum can be accessed on a flexible basis, businesses, individuals, and communities could employ the best combination of wireless technologies (e.g., mobile, Wi-Fi, satellite) to meet their needs.

[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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New technologies, such as automatic frequency coordination (AFC) systems, are making spectrum sharing increasingly feasible, giving regulators scope to develop efficient spectrum management policies that will benefit citizens and businesses. Better and broader connectivity will help drive sustainable development.

The proposed Spectrum Policy represents a significant and welcome step towards a flexible framework that will encourage innovation in new technologies, business models and services.

Last year DSA conducted extensive research and interviewed key stakeholders about South Africa's spectrum management framework and the country's readiness to harness the full potential of spectrum sharing. Having conducted a detailed gap analysis to assess the extent that South Africa is following global best practices for spectrum sharing policy, the DSA supports the Spectrum Policy's proposals to –

- transform from "right to exclusivity" into "right to protection from interference" for the licensed spectrum bands (section 12(b)), which opens the way for spectrum sharing.
- implement the "use it or share it" principle (sections 12(d), 16(b) and 16(c)), which ideally should apply across all spectrum bands to ensure that no assigned spectrum remains unused for more than 24 months.
- allow the use of licence-exempt bands (section 13). Section 13(c) should be clarified such that it does not prevent the use of standard power Wi-Fi, supported by AFC systems to avoid interference.
- allow license exempt access to more spectrum to support new Wi-Fi technologies (section 13(d)). South Africa should consider opening the entire 6 GHz band (6425-7125 MHz) for licence-exempt WAS/RLAN use, to facilitate deployment of the next generation WAS/RLAN technologies, such as Wi-Fi 6E and Wi-Fi 7.
- prevent the hoarding of spectrum (section 16). If hoarded spectrum is unused and is not shared with other entities, there will be an opportunity cost in terms of lost GDP contribution, supplier surplus and consumer surplus.
- permit spectrum sharing and spectrum trading (section 17).
- require the regulator, along with the Competition Commission, to consider the possible impact on competition of any spectrum sharing, trading or similar arrangement (section 17(a)(ii)
- permit the use of technologies that will enable greater levels of spectrum sharing, such as AFC systems, building on the experience of the TVWS database that was developed by the CSIR (section 17(c)
- permit spectrum refarming and migration (section 18)

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- introduce community networks and reserve spectrum for community use (sections 20 and 21). Community networks will require sufficient amounts of both licensed and licence-exempt spectrum to provide affordable services to the community.
- the proposal in section 21.2(e) to continuously identify and streamline or eliminate regulatory requirements that may impede the commercial viability and sustainability of community networks.

In addition to the above measures, the DSA also recommends the introduction of:

- Standalone spectrum sharing regulations with fair, transparent and explicit criteria. The current provision in RFS regulation 2015 is too vague and is being used to lock out new entrants.
- Incentives for incumbents who cooperate and agree to share their frequency spectrum with other operators or entities that have little or no access to IMT identified spectrum.
- Explicit spectrum sharing provisions that will make it possible for operators, enterprises and other entities that currently do not hold an IMT spectrum licence to have shared access to High Demand IMT spectrum.
- Spectrum caps for groups of spectrum bands e.g. low band, mid-band and high band frequency bands. These spectrum caps should prevent the concentration of IMT spectrum in the hands/control of a few licensees.
- Incentives for mobile networks deployments. If operators are not using most of the spectrum that was assigned to them, then that spectrum should be returned to ICASA for reassignment to other interested parties.
- A regulatory sandbox that will allow live testing of new technologies, services and business models.

The justification for these requests is provided in the sections below.

Obstacles to spectrum sharing in South Africa

In October 2019, the DSA published the report *Enhancing Connectivity through Spectrum Sharing*[2], which outlined how new forms of spectrum sharing could enable many more people to benefit from broadband connectivity and digital services. The report noted that some South African stakeholders considered that the existing spectrum sharing regulatory provision was too vague and was being

[2] https://policyimpactpartners.com/wp-content/uploads/2019/10/Enhancing-Connectivity-Through-Spectrum-Sharing.pdf

used to stifle competition by locking out new entrants. The prevailing interpretation was that existing IMT licensees could only share their unused spectrum with each other.

Subsequent efforts to conduct a spectrum sharing trial in South Africa where new entrants would share incumbents' unused IMT spectrum were hampered by the reluctance of the incumbents to make their unused licensed spectrum available for the trial. Smaller IMT spectrum licensees said that they had entered into spectrum sharing agreements with the larger MNOs thus making their spectrum holdings unavailable for sharing with any other entity. This dynamic suggested these spectrum sharing arrangements that are not aligned with the principle of enabling a large number of stakeholders to access spectrum and enhancing a larger ecosystem could be anti-competitive in nature.

The DSA analysis of South Africa's spectrum management framework

During 2022, the DSA conducted extensive research and interviewed key stakeholders about South Africa's spectrum management framework. We used the answers to assess the extent that South Africa is following global best practices for spectrum sharing policy The results of that assessment are shown in the chart below, which summarizes South Africa's readiness to adopt dynamic spectrum access.

This analysis is inspired by the report Taking Stock of Spectrum Sharing[3] published by John Leibovitz and Ruth Milkman, which distilled several principles that are essential to a successful spectrum sharing policy. We have assigned a qualitative score from 1 (i.e. the principle is not followed) to 5 (i.e. the principle is followed and specific actions have been successfully taken) for each principle to indicate whether it has been taken into consideration and successfully applied.

The results reflect South Africa's record as an early adopter of technologies, exemplified by the early publication of relevant standards, implementation of a spectrum sharing database and automation (TVWS) and strong interference management and enforcement. ICASA is also willing to facilitate testing of new technologies through its trial licence framework. Technology can be used to make spectrum assignment data more easily accessible to the public, for instance by allowing searches through ICASA's website. However, the current facility on the ICASA website is practically unusable to the average person and only provides a snapshot of assignments at a specific time[4].

[3] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3916386

[4] https://www.icasa.org.za/legislation-and-regulations/spectrum-usage-and-availability-q1-2019

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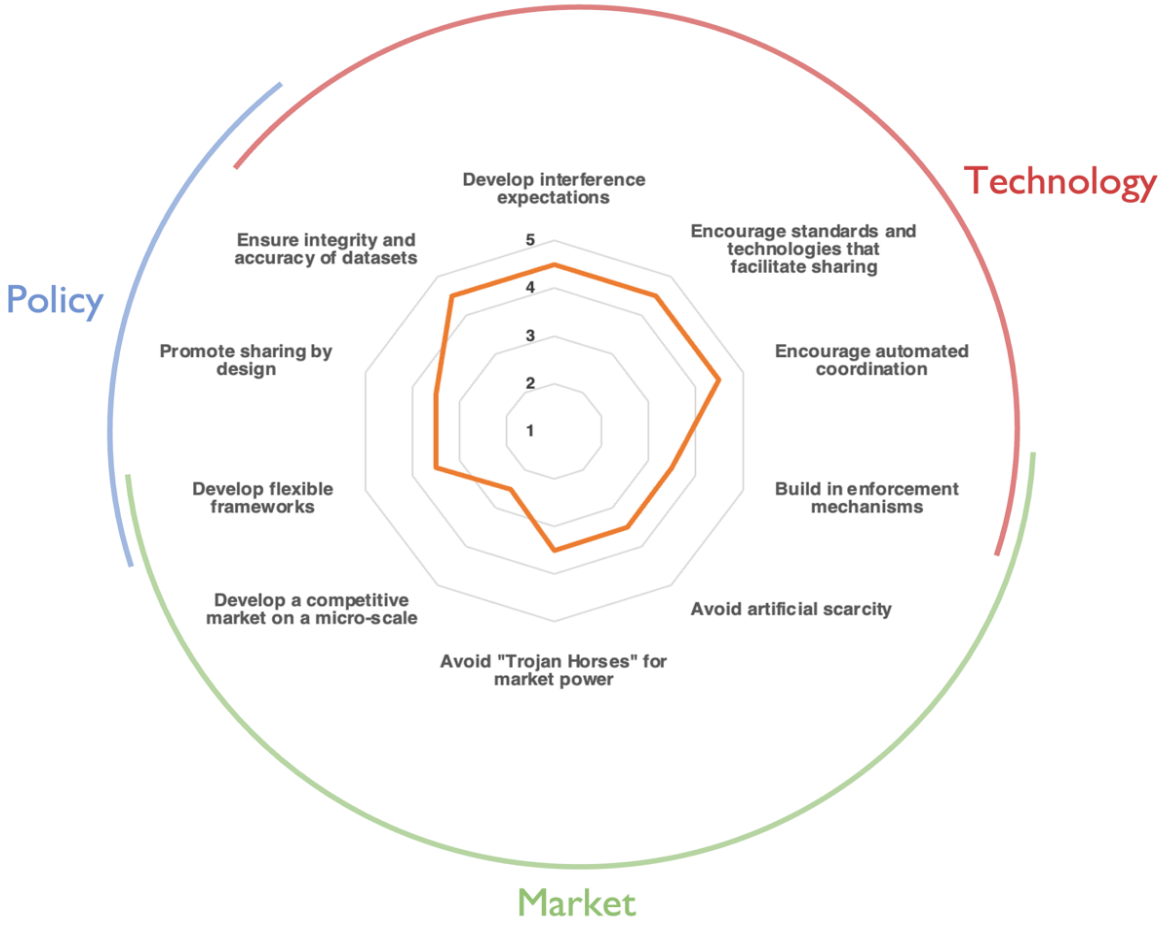
How South Africa scores against the criteria required to fully harness spectrum sharing



Further, our assessment found that the country has yet to enact all the policy and market measures required to fully harness the potential of spectrum sharing to improve connectivity. More work is required to develop policies and regulations that are flexible and promote spectrum sharing by design. The current instruments are too vague and unfortunately allow the incumbents to use a narrow interpretation of who can share the IMT spectrum in order to lock out competition.

In South Africa, IMT spectrum (known as High Demand Spectrum) is fully assigned to six national MNOs. However, large amounts of this IMT spectrum remains unused in rural areas, despite debates around spectrum scarcity. At present, to share this spectrum, a prior agreement needs to be reached with one of the license-holders. Additionally, an application to ICASA is required for approval of a spectrum sharing agreement in terms of the 2015 Radio Frequency Spectrum

Regulations. However, those spectrum sharing regulations imply that both parties will be High Demand Spectrum holders.

Although six entities have licensed High Demand IMT spectrum, South Africa only has two truly national mobile broadband networks. More effort, therefore, needs to be put into promoting a competitive market on a micro scale, preventing "Trojan Horses" for market power and avoiding artificial scarcity of spectrum.

The National Development Plan 2030 (NDP) for South Africa emphasizes the need to "implement a service and technology-neutral flexible licensing regime" and to "free spectrum for efficient use, to drive down costs and stimulate innovation".

DSA believes that providing additional spectrum access options through use of new spectrum management tools, such as dynamic shared access systems, will benefit competition, create conditions for innovation, and spur more rapid deployments of wireless networks and services.

More licence-exempt spectrum required

South Africa needs to achieve the right balance between licensed spectrum for IMT services and licence-exempt spectrum that can be used by WAS/RLANs (wireless access services/radio local area networks), such as Wi-Fi.

As public Wi-Fi hotspots are one of the main ways to bring broadband access to unconnected communities, Wi-Fi plays a critical role in narrowing the digital divide in South Africa. There are currently 640,000 public Wi-Fi access points in South Africa, according to Cisco, while the country's smartphone users spend more than half their online time connected to Wi-Fi[5].

While Wi-Fi traffic grows rapidly, only 455 MHz (5150-5350 MHz and 5470-5725 MHz) of mid-band spectrum has been made available for licence-exempt use in South Africa. As this band is fragmented, it does not provide channels wide enough to support newer applications and services that will be offered by new generation Wi-Fi 6E and Wi-Fi 7.

In July 2021 the African Telecommunications Union (ATU) published Recommendation ATU-R 005, which makes provision for the lower 6 GHz (5925-6425 MHz) band to be made available for use by licence-exempt WAS/RLANs[6]. Sixteen months after the ATU Recommendation was

[5] Source: https://www.opensignal.com/2020/06/08/mobile-network-experience-during-the-covid-19-pandemic-june-update

[6] ATU-R Recommendation 005-0

published, this recommendation has not been implemented in South Africa, despite the update of the National Radio Frequency Plan in March 2022.

The high density of Wi-Fi routers operating in 2.4 GHz and 5 GHz spectrum bands results in congestion which means that many fixed-line broadband subscribers do not enjoy the throughput speeds the infrastructure could deliver[7]. The congestion in these bands is getting worse as more Wi-Fi devices are deployed. Licence-exempt access to the 6 GHz band would resolve this problem by increasing router capacity and would reduce congestion, thus increasing average broadband speed[8].

With access to the full 1200 MHz in the 6 GHz band, Wi-Fi could employ multiple non-overlapping channels of 160 MHz and 320 MHz bandwidth. The use of these wider channels would increase spectrum efficiency while maintaining the ability to share spectrum with incumbents and other licence-exempt deployments. By employing 320 MHz channels, Wi-Fi 7 will further improve latency, throughput, reliability, and quality of service.

A recently published study by Telecom Advisory Services, commissioned by the DSA, presents the economic value of allowing unlicensed use of the entire 6 GHz band (5925-7125 MHz) in South Africa.[9] It estimates 'the cumulative economic value between 2021 and 2030 associated with allocating the 1200 MHz in the 6 GHz band to Wi-Fi in South Africa would be US$ 57.76 billion. This is broken down into US$ 34.81 billion in GDP contribution, US$ 13.32 billion in producer surplus to South African enterprises, and US$ 9.63 billion in consumer surplus to the South African population.'[10]

In addition, the allocation of the entire band to unlicensed use will result in a significant contribution to a reduction of South Africa's digital divide. By providing affordable paid service and free access over hot spots as a result of allocating the full 6 GHz band to Wi-Fi, an incremental 1,252,600 South Africans will be able to gain access to the Internet by 2030.[11]

[7] ICASA. 2022. State of the ICT Sector Report in South Africa. https://www.icasa.org.za/uploads/files/State-of-ICT-Sector-Report-March-2022.pdf

[8] Katz, R & Callorda, F. 2021. Assessing the economic value of unlicensed use in the 6 GHz Band in South Africa. https://6ghz.info/wp-content/uploads/2022/09/Assessing-the-economic-value-of-unlicensed-use-of-the-6GHz-band-in-South-Africa-DSA-Oct-21.pdf

[9] See https://www.totaltele.com/512580/6-GHz-unlicensed-access-and-Wi-Fi-6E-to-add-billions-to-Indonesian-and-African-economies-reveals-Dynamic-Spectrum-Alliance

[10] Dynamic Spectrum Alliance, "Assessing the economic value of unlicensed use of the 6 GHz band in South Africa"

[11] Idem

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The DSA has already presented this study to ICASA and has also shared detailed comments on the recent the Long-Term Spectrum Outlook in South Africa for Public Consultation that are available online as a complement to our comments here.[12]

Conclusion

As fixed broadband penetration in South Africa stands at just 10%, efficient use of spectrum will be vital to meet the need for connectivity across both urban and rural areas. The DSA's extensive research into South Africa's spectrum sharing framework has highlighted the need to supplement a willingness to embrace new technologies with supportive policy and market measures. If the new Spectrum Policy leads to much more extensive and broader sharing of IMT spectrum and licence-exempt access to the full 6 GHz band, South Africa will realize major socio-economic benefits.

A truly flexible spectrum framework will enable South Africa to fully harness the potential of advanced technologies, such as Wi-Fi 6E, Wi-Fi 7 and 5G, while also increasing the network capacity needed to reduce congestion. The resulting step change in connectivity will help to close the digital divide, fuel economic activity, support innovation and broaden access to key services, such as healthcare, education and public information.

The DSA is available to discuss these comments and any additional requirements the Department of Communications and Digital Technologies might have.

Respectfully submitted,

Martha SUAREZ
President,
Dynamic Spectrum Alliance

[12] See: http://dynamicspectrumalliance.org/wp-content/uploads/2022/03/DSA-Comments-to-ICASA-on-Inquiry-into-Long-Term-Spectrum-Outlook.pdf