



CRAN

Communications Regulatory Authority of Namibia



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SPECTRUM ASSIGNMENT STRATEGY 2022-2024

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Objectives

- Facilitate the availability of spectrum to be used as a tool to develop communications services and access to ICT infrastructure as a basis for social and economic development to benefit from the digital transformation and opportunities presented by the 4th industrial revolution (4IR);
- Promote competition through minimisation of constraints on spectrum use within a service and technology neutral license regime allowing similar services to be offered on different technology platforms;
- Promote the effective and efficient use of spectrum;
- Set conditions for spectrum use to ensure efficient use of a scarce resources and prevent anti-competitive practices such as hoarding of spectrum;
- Promote and if necessary enforce freeing up spectrum space for assignment to emerging technologies and services by phasing out ageing technologies;
- Ensure fair distribution of spectrum between market players;
- Set spectrum fees and
- Monitor, investigate and enforce adherence to the regulatory framework.

Basis for the proposed strategy

**This strategy is based on the frequency allocations in the
Frequency Band Plan for Namibia as published in
Government *Gazette* No. 7613, General Notice No. 488
on 31 August 2021**

Emerging technologies considered

- International Mobile Telecommunications (IMT)
- High-Altitude Platform Stations (HAPS)
- Wi-Fi in 6 GHz
- WiGiG in 60 GHz

Spectrum availability for IMT

Low-band spectrum

Spectrum band	Availability
703-733 MHz paired with 758-788 MHz	2x 30 MHz FDD
791-821 MHz paired with 832-862 MHz	2x 20 MHz FDD
880-915 MHz paired with 925-960 MHz	None

Spectrum availability for IMT

Mid-band spectrum

Spectrum band	Availability
1427-1518 MHz	98 MHz TDD
1710-1785 MHz paired with 1805-1880 MHz	None
1920-1980 MHz paired with 2110-2170 MHz	2x 10 MHz FDD
2300-2400 MHz	None, until legacy services are discontinued
2500-2690 MHz	35 MHz TDD (fragmented)
3300-3600 MHz	191 MHz TDD (fragmented) 100 MHz (footnote assignment)

Spectrum availability for IMT

High-band spectrum

Spectrum band	Availability
24.25-27.5 GHz	2.75 GHz TDD
37-43.5 GHz	5.078 GHz TDD

Options to ensure spectrum availability for IMT

- Discuss and agree with affected licensees timelines to discontinue legacy fixed and broadcasting technologies
- Propose a roadmap to discontinue 2G mobile network as technology does not meet minimum requirements of National Broadband Policy
- Restrict spectrum utilization for fixed satellite services above 3800 MHz
- Amend spectrum assignments to create contiguous blocks of vacant spectrum in 2600 MHz and 3500 MHz
- Cancel spectrum licences in the event that licensees are in material breach of spectrum licence conditions

Spectrum availability for HAPS

HAPS requires minimal ground infrastructure and it is foreseen that the technology has the potential to-

- Extend broadband services to end users in remote areas;**
- Provide fixed wireless backhaul links between mobile and core networks as well as backhaul for IoT deployments in the energy and agricultural sector; and**
- Provide for rapid deployment of communications in disaster situations.**

Spectrum availability for HAPS

Frequency range	Service	Direction	ITU Reference
1885-1980 MHz	Mobile	Uplink	RR No. 5.388A Resolution 221(Rev.WRC-07)
2010-2025 MHz	Mobile	Uplink	RR No. 5.388A Resolution 221(Rev.WRC-07)
2110-2170 MHz	Mobile	Bi-directional links	RR No. 5.388A Resolution 221(Rev.WRC-07)
31-31.3 GHz	Fixed	Bi-directional links	RR No. 5.543B Resolution 167 (WRC-19)
38-39.5 GHz	Fixed	Bi-directional links	RR No. 5.550D Resolution 168 (WRC-19)
47.2-47.5 GHz	Fixed	Bi-directional links	RR No. 5.552A Resolution 122 (Rev.WRC-19)
47.9-48.2 GHz	Fixed	Bi-directional links	RR No. 5.552A Resolution 122 (Rev.WRC-19)

Spectrum availability for Wi-Fi in 6 GHz

The Authority took into consideration that-

- ❑ The use of licence-exempt spectrum to lower the barrier of entry for smaller licensees focussing on the provisioning of last mile access;
- ❑ Wireless access is widely used in the residential and business environment to connect a variety of devices to broadband services provided by licensees.
- ❑ Availability of multi-band CPE's capable of operating in the existing spectrum licence exempt bands as well as the lower 6 GHz (5925-6425 MHz) spectrum band;
- ❑ Technical conditions set by other countries within ITU region 1 to allow for licence exempt use allowing for indoor use and very low power outdoor use considering that the spectrum band set out under (i) above are allocated to fixed and fixed satellite services on a primary basis. and

Spectrum availability for Wi-Fi in 6 GHz

Frequency Band	Application	Maximum Power or field strength	Technical Conditions	Notes
5925-6425 MHz	WAS/RLAN	23 dBm (200 mW) mean e.i.r.p [*]	Mean e.i.r.p density for in-band emissions - 10 dBm/MHz An adequate spectrum sharing mechanism shall be implemented for channel access and occupation	Restricted to indoor use only by Low Power Indoor (LPI) LPI access point or bridge is a device that is supplied with power from a wired connection, has an integrated antenna and is not battery powered** LPI client device is a device connected to a LPI access point or another LPI client device and may or may not be battery powered. Outdoor use (including in road vehicles) is prohibited

Spectrum availability for WiFi in 6 GHz (cont.)

Frequency Band	Application	Maximum Power or field strength	Technical Conditions	Notes
5925-6425 MHz	WAS/RLAN	14 dBm (25 mW) mean e.i.r.p [*]	Very Low Power (VLP) indoor and outdoor use A VLP device is a portable device Mean e.i.r.p density for in-band emissions -1 dBm/MHz An adequate spectrum sharing mechanism shall be implemented for channel access and occupation Use on drones are prohibited	

Spectrum availability for WiGiG in 60 GHz

The Authority took into consideration the-

- ❑ Availability of multi-band CPE's capable of operating in the existing spectrum licence exempt bands as well as the lower 60 GHz (57-66 GHz) spectrum band;
- ❑ Technical conditions set by other countries within ITU region 1 to allow for licence exempt use allowing for indoor use and very low power outdoor use considering that the spectrum band set out under (i) above are allocated to fixed and satellite services on a primary basis.

Spectrum availability for WiGiG in 60 GHz

Frequency Band	Application	Maximum Power or field strength	Technical Conditions	Harmonised standard	Notes
57-66 MHz	WAS/RLAN	40 dBm (10 W) mean e.i.r.p (indoor only) 23 dBm/MHz e.i.r.p density	An adequate spectrum sharing mechanism shall be implemented	WiGiG 802.11 ad EN 302 657	Fixed outdoor installations are excluded
57-66 MHz	WAS	40 dBm (10 W) mean e.i.r.p (indoor only) 23 dBm/MHz e.i.r.p density Maximum transmit power of 27 dBm at the antenna port/s	An adequate spectrum sharing mechanism shall be implemented	Draft EN 303 722 Draft EN 303 753	

Spectrum availability for WiGiG in 60 GHz

Frequency Band	Application	Maximum Power or field strength	Technical Conditions	Harmonised standard	Notes
57-66 MHz	WAS	55 dBm (316W) mean e.i.r.p 38 dBm/MHz e.i.r.p density Transmit antennae gain \geq 30 dBi	An adequate spectrum sharing mechanism shall be implemented	Draft EN 303 722	Fixed outdoor installations

Spectrum availability for Broadcasting Services

- Digital Sound Broadcasting (DAB) – 214-230 MHz
- Digital Sound Broadcasting (DRM) – 148.5-200 kHz and 535.5-1606.5 kHz
- Analogue Sound Broadcasting (FM) – 87.5 – 108 MHz
- Digital Terrestrial Television Broadcasting – 174-230 MHz and 470-694 MHz

Strategic Objectives

- The Authority, assumes full responsibility for spectrum assignment based on the principles of independent decision-making and is thus impartial with respect to all market players.**
- The Authority's primary and legislative objective is to promote competition, to ensure that sufficient spectrum is available to provide services highly valued by end users and meet public safety and security requirements and enforce the efficient use of a scarce resource.**
- The Authority holds the view that ICT plays a vital role in socio-economic development and going forward the digital transformation of Namibia as well as the attainment of a Fourth industrial revolution.**

Strategic considerations

The Authority intends to make spectrum available and impose licence conditions to attain the following strategic objects-

- Allow for the implementation of new technologies to promote innovation and availability of a wide array of high-quality services to all Namibians as per the objects of the Communications Act;
- Set spectrum licence conditions to ensure access to broadband networks and ensure that these services can be utilised by Namibians in line with the targets set out in national policies;
- Ensure that spectrum is utilised to provide broadband services in unserved and underserved areas through implementation of the Universal Access Fund ;and
- Ensure that spectrum is utilised to foster digital transformation beyond the delivery of broadband through implementation of e-education, e-health, e-agriculture and other use cases to realise the true benefits of new technologies.

Spectrum Assignment Methodology

Spectrum assignment will be concluded as follows-

- Any spectrum band which is vacant or has become vacant as a result of migration to other spectrum bands at the instruction of the Authority will not be open for application until so designated by the Authority.**
- A spectrum licence is awarded on a right-to-use basis in accordance with the Communications Act and does not confer ownership rights to the recipient of a spectrum licence.**
- No service licensee will be assigned more spectrum than necessary and the Authority may impose caps on the amount of spectrum to be assigned to a single licensee to ensure fair and equitable assignment of spectrum to all service licensees.**
- The award of spectrum licences will be done in strict adherence to the Frequency Band Plan of Namibia**

Spectrum Assignment Methodology(cont.)

- ❑ Regulations and/or notices in regard to spectrum licences are published in the Government Gazette following pre-described regulatory processes and public consultations as and when required
- ❑ Applications for spectrum licences submitted by entities that does not require a telecommunications or broadcasting service licence will be considered on a first-come-first-serve basis
- ❑ Application for spectrum licences by service licences to be utilised for provision of telecommunications and broadcasting services will be considered through the application of a hybrid model allowing the Authority to follow an administrative and/or flexible-rights of use approach to consider the spectrum licence based on the spectrum band applied for, the conditions to be attached to the spectrum licence
- ❑ The Authority may award a spectrum licence limiting the utilisation thereof to a specific geographical area or to implement licensed shared access allowing for sharing of spectrum

Spectrum Assignment Roadmap

In developing this roadmap, the Authority has considered the following-

- The spectrum needs submitted by licensees in response to the Authority's request herein in 2021;
- Spectrum already available for application;
- Broadcasting spectrum to be released for application on a first-come-first-serve basis;
- Mobile spectrum in 800 MHz and 2100 MHz will be released for application via spectrum auction
- IMT-2000 and IMT-2020 spectrum in 700 MHz, 2300 MHz, 2600 MHz and 3500 MHz will be released for application via spectrum auction.;
- IMT-2020 spectrum in the spectrum bands above 24 GHz will be released for application on a first-come-first-service basis in that there is sufficient availability of spectrum to meet demand.

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum already available for application			
Analogue Sound Broadcasting	87.5-108 MHz	Open for application on first-come-first-serve basis.	FM frequency channelling plan applies. Frequencies available for application has been published in Government Gazette No. 7312, General Notice No. 344 on 19 August 2020.
Digital Sound Broadcasting	214-230 MHz	Open for application on first-come-first-serve basis.	DAB frequency channelling plan applies. Frequencies available for application has been published in Government Gazette No. 7300, General Notice No. 320 on 7 August 2020.
Digital Sound Broadcasting	148.5-200 kHz 535.5-1606.5 kHz	Open for application on first-come-first-serve basis.	DRM frequency channelling plan applies. Frequencies available for application has been published in Government Gazette No. 7300, General Notice No. 320 on 7 August 2020.

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum already available for application			
Fixed services	Various spectrum bands	Open for application on first-come-first-serve basis.	Frequency channelling plan indicated in national frequency band plan applies. Spectrum bands available for application has been published in Government Gazette No. 6982, General Notice No.323 on 30 August 2019.
Satellite services	Various spectrum bands	Open for application on first-come-first-serve basis.	Spectrum bands available for application has been published in Government Gazette No. 6982, General Notice No.322 on 30 August 2019.

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released for application 2022-2023			
Mobile services	1920-1980 MHz paired with 2110-2170 MHz	Quarter 2 of 2022 – Quarter 3 of 2022 to be awarded via spectrum auction.	2 x 10 MHz FFD national spectrum assignment subject to rollout obligation/use cases set by the Authority. The rollout obligations will be based on the gap analysis as determined by the Authority.
IMT services	791-821 MHz paired with 832-862 MHz	Quarter 3 of 2022 to be awarded via spectrum auction	2 x 20 MHz FFD national spectrum subject assignment subject to rollout obligation set by the Authority. The rollout obligations will be based on the gap analysis as determined by the Authority. Dynamic spectrum sharing between 4G and 5G will be encouraged going forward.

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released for application 2022-2023			
IMT services	1427-1518 MHz	Quarter 2 of 2022 on first-come-first-serve basis.	TDD assignment on geographical and licensed shared basis to support specific use cases presented to the Authority as time of application
IMT services	24.25-27.5 GHz	Quarter 2 of 2022-Quarter 3 of 2022	TDD assignment to support specific use cases from IMT-2020 (5G) presented to the Authority at time of application
IMT services	37-43.5 GHz	Quarter 2 of 2023 to Quarter 3 of 2023 on first-come-first-serve basis.	TDD assignment on geographical and licensed shared basis to support specific use cases presented to the Authority as time of application.

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released once dependencies has been resolved			
IMT services	694-790 MHz	Quarter 1 of 2023 to quarter 2 of 2023 via spectrum auction	<p>Release of spectrum for application is dependent on the adherence of NBC to cut-off date for migration of legacy analogue TV transmitters by 31 December 2022.</p> <p>Spectrum awarded for analogue television broadcasting to be returned to the Authority by 31 December 2022.</p> <p>2x 30 MHz FDD national spectrum subject assignment via spectrum auction subject to rollout obligations and specific use cases set by the Authority.</p>

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released once dependencies has been resolved			
IMT services	2300-2400 MHz	Quarter 1 2023 to Quarter 2 2023 via spectrum auction	<p>Release of spectrum for application is dependent on sunset date for discontinuation of Rurtel fixed service to be agreed with licensee after a consultation process.</p> <p>Spectrum awarded for fixed services to be returned to the Authority.</p> <p>TDD national spectrum subject assignment via spectrum auction subject to rollout obligation set by the Authority.</p>

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released once dependencies has been resolved			
IMT services	2500 -2690 MHz	Quarter 3 2023 to Quarter 4 2023	<p>Spectrum will be released upon completion of the re-planning of this spectrum band to address fragmented availability of spectrum in cooperation with licensees that already hold spectrum licenses in this spectrum band.</p> <p>The Authority will determine the method of assignment of this spectrum upon completion of the re-planning exercise.</p>

Spectrum Assignment Roadmap (cont.)

Service	Spectrum Band/s	Time Frame	Additional Information
Spectrum to be released once dependencies has been resolved			
IMT services	3300-3600 MHz	Quarter 3 2023 to Quarter 4 2023	<p>Release of spectrum for application is dependent on the sunset date for discontinuation of legacy WiMax/ fixed services technology to be agreed with licensee after a consultation process.</p> <p>Spectrum awarded for fixed services to be returned to the Authority.</p> <p>Spectrum will be released for TDD national spectrum assignment subject assignment via spectrum auction subject to rollout obligations and specific use cases set by the Authority.</p>



Spectrum Pricing

The Authority will base spectrum fees taking into consideration-

- The availability or scarcity of spectrum for assignment in a specific spectrum band;
- The market value of spectrum made available for assignment by the Authority;
- Utilise spectrum pricing to enforce the efficient use of spectrum through deployment of more spectrally efficient equipment by licensees;
- The level of demand for spectrum in a given spectrum band;
- Consumer demand for services;
- Impact of inflation based on annual consumer price indexes as published from time to time;
- Prevention of spectrum hoarding resulting in a negative impact on the competition and growth of the ICT sector; and
- Full cost recovery of spectrum management costs incurred by the Authority in executing its mandate as set out in the Communications Act given that the Authority is not funded in any way by the Namibian Government.

Spectrum fees in respect of spectrum assigned through a spectrum auction will be determined through the outcome of the bidding process

Comments from stakeholders

Written comments were received from licensees and international stakeholders as listed below

- Multichoice Namibia (Pty) Ltd
- Telecom Namibia Limited
- Mobile Telecommunications Limited
- Paratus Telecommunications (Pty) Ltd
- Witel Service Provider (Pty) Ltd
- Policy Impact Partners
- Omnispace LLC
- Global Satellite Operators Association
- DECT Forum
- Shure Incorporated
- SOS
- Association of Professional Production Technologies
- Apple Operations Europe
- Intel Corporation

Summary of Comments

Spectrum below 1 GHz

☐ Comments received from licensees

- The migrations of TV analogue services to DTT should be concluded by the deadline of June 2014
- Licensee requires spectrum for deployment of rural LTE

☐ Comments received from International stakeholders

- Strategy does not address future spectrum needs for wireless microphones
- Spectrum bands should be harnessed to improve coverage before identifying more mid-band spectrum for IMT
- Support the objectives of the strategy

Summary of Comments

Spectrum bands below 7 GHz

- ❑ **Comments received from licensees**
 - **Specification of guard bands and emission thresholds in band and adjacent bands**
 - **How will CRAN regulate WiFi6?**
 - **How will CRAN regulate ISPs buying equipment that are intended for outdoor use and P2MP in 6GHz and lower bands**

- ❑ **Comments received from International stakeholders**
 - **Proposed that entire 6GHz band should be consider to licence exempt use**

Summary of Comments Spectrum above 24GHz

Comments received from licensees

- None

Comments received from International stakeholders

- Objected to CRAN considering the deployment of 5G in 66-71 GHz as it will hinder technological innovation in the bands just below 66 GHz
- Co-frequency sharing in 37-43.5 GHz between IMT and Fixed Satellite receivers is challenging and specific consideration is required to consider the most efficient solution for spectrum sharing

Summary of Comments

General Comments

- ❑ **Comments received from licensees**
 - **What is CRAN's plans toward protection of existing services, licensees' revenues, sustainability and customers on the identified bands**
 - **Establish criteria for hoarding and procedures to withdraw licences in such instances**
 - **To make provision for licensees to apply for spectrum outside the provisions of regulatory 4(1) notices**

- ❑ **Comments received from International stakeholders**
 - **Proposed that entire 6GHz band should be consider to licence exempt use**

Conclusion

- The Authority will take into consideration all comments received**
- The Authority will undertake a review of the following regulations-**
 - Spectrum fee regulations;**
 - Frequency channelling plan for FM analogue broadcasting; and**
 - Licence Exempt Spectrum (Annexure B to the Spectrum Licensing Regulations)**

Thank you!