



Wednesday, 22 January 2020

Attention:

Mr. Davis Kgosimolao Moshweunyane
Independent Communications Authority of South Africa
350 Witch-Hazel Avenue, Eco Point Office Park,
Eco Park, Centurion, Gauteng

Via e-mail : DMoshweunyane@icasa.org.za

Dear Mr. Davis Kgosimolao Moshweunyane

RE: Intel Corporation submission on the "Information Memorandum for International Mobile Telecommunications (IMT) Spectrum Assignment"

Intel Corporation ("Intel") welcomes the opportunity to respond in writing to the invitation to submit written representations and present our views on the "**Information Memorandum for IMT Spectrum Assignment**".

Intel is a world leader in the design and manufacturing of essential technologies and platforms that power the cloud and an increasingly smart, connected world. Our technologies unlock the power of data so that we can ride in self driving cars, connect with each other over lightning fast mobile networks i.e. 5G, have artificial intelligence improve many aspects of our lives, and experience virtual worlds. Intel works with Governments, policy-makers and industries around the world to advocate policies that encourage new ideas, promote faire commerce, and protect resources. By promoting innovation and competition worldwide, and advancing leading governance and corporate responsibility practices, Intel seeks to help people and businesses thrive in an increasingly global economy.

Intel's views on the "**Information Memorandum for IMT Spectrum Assignment**" are contained in the subsequent pages (page 3 to 6).

Please do not hesitate to contact me, should you require any additional information.

Sincerely Yours;

A handwritten signature in black ink, appearing to read "S. AGBOKPONTO SOGLO".

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Submission to the Independent Communications Authority of South Africa on the “Information Memorandum for International Mobile Telecommunications (IMT) Spectrum Assignment”

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1. Introduction

The Independent Communications Authority of South Africa ("the Authority"), published on the 1st November 2019 (in Government Gazette No. 42820), the Information Memorandum aimed at outlining the Authority's intentions with regards to the licensing process for IMT spectrum pursuant to consideration of the Policy on High Demand Spectrum and Policy Direction on the Licensing of a Wireless Open Access Network dated 26 July 2019.

Interested persons were invited to submit written representations, including an electronic version of the representation in Microsoft Word, of their views on the Information Memorandum by no later than 16h00 on Friday, 31 January 2020.

Intel Corporation's submission is mainly focused on parts of the proposed spectrum for the award as described in Section 5 of the ICASA **Information Memorandum for IMT Spectrum Assignment**.

2. Proposed Spectrum for the Award (Section 5)

The fifth-generation wireless technologies, referred to as 5G, represent more than just another step in the evolution of wireless. 5G is the convergence of wireless with computing and the cloud. 5G addresses existing, emerging and future uses delivering diverse services with usage scenarios such as 1) Enhanced Mobile Broadband (eMBB) with immersive experiences (Virtual Reality, Augmented Reality); 2) Internet of Things (IoT) with applications such as Massive Machine Type Communication (Smart home, smart cities, sensors) and 3) Ultra Reliable Low Latency Communications (URLLC) with applications such as Mission Critical Type Communication (Autonomous driving, Industrial).

5G will enable a diverse set of use cases and applications – each with different requirements in terms of spectrum. Therefore, to enable 5G there is a need to make sufficient spectrum available; including **licensed spectrum** (in low-band – below ~1 GHz (e.g. 700 MHz / 800 MHz band); mid-band – between ~2 – 4 GHz (e.g. 3300 – 3600 MHz); and high-band – above 24 GHz (e.g. within 24.25 – 29.5 GHz and 37 – 43.5 GHz)) as well as **license-exempt spectrum** (unlicensed spectrum in the 5 – 6 GHz band; and unlicensed spectrum accessed in the 60 GHz range).

Given the fact that, the first wave of 5G service deployments is using 5G frequencies for improved data throughput, leveraging existing 4G deployments for smoother migration to 5G; Intel supports ICASA's decision to make the 700 MHz / 800 MHz and the 2 600 MHz bands available for **LTE/LTE-Advanced deployment as soon as possible in 2020**.

2.1 700 MHz / 800 MHz Bands (Sections 5.1.1 & 5.1.2)

The 700 MHz band (3GPP Band 28a: UL- 703 – 733 MHz / DL- 758 – 788 MHz) and 800 MHz band (3GPP Band 20: DL – 791 – 821 MHz / UL- 832 – 862 MHz) are excellent for wide area coverage of LTE and also 5G in regional and rural environments, for in-building coverage, and represent an important digital dividend arising from the shift by TV broadcasters to digital transmissions.



In its recently published report in October 2019¹, the GSA indicated that it has identified 97 operators investing in APT 700 MHz spectrum (Band 28), including 95 with licences and 58 having launched commercial LTE services in this band. In addition, the report also pointed out that the 800 MHz band (Band 20) is the most used sub-1 GHz band with 226 companies investing in LTE at 800 MHz, including 199 that have launched networks at 800 MHz, 25 other licensed operators and two more planning networks at 800 MHz. The list of future licensing activity detail by country can be found on page 8 to page 25 of the report.

On the device side, according to the GSA², 2154 LTE FDD user devices and 6388 LTE FDD user devices are on the market globally in 700 MHz (Band 28) and 800 MHz (Band 20) bands respectively.

Therefore, Intel supports the Authority's decision to make 2x30 MHz in the 700 MHz band (703 – 733 MHz // 758 – 788 MHz) and 2x30 MHz in the 800 MHz band (791 – 821 MHz // 832 – 862 MHz) available for assignment in this process.

2.2 3 500 MHz band (Sections 5.1.5 and 5.3.10)

Work undertaken at WRC-07 and WRC-15, led to the identification of 3 400 – 3 600 MHz for IMT use throughout ITU Regions 1 and 2, and in many countries in ITU Region 3. This has helped support the development of an IMT ecosystem in this frequency band.

At WRC-15, the frequency band 3 300 – 3 400 MHz was allocated to the mobile, except aeronautical service, through various footnotes, and is identified for IMT in forty-five (45) countries across the three regions of the ITU, with thirty three (33) in Africa (Region 1), six (6) in the Americas (Region 2) and six (6) in Asia (Region 3). The outcome of the WRC-19 consolidated the acceptance of the 3 300 – 3 700 MHz band globally.

Considering that the 3 300 – 3 400 MHz band is adjacent to the near-globally harmonised 3 400 – 3 600 MHz band, the frequency arrangement F3 (TDD: 3 300 – 3 700 MHz) described in recommendation ITU-R M.1036-6 (*Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications in the bands identified for IMT in the Radio Regulations*) approved at the Radiocommunication Assembly 2019, provides the possibility for South Africa to implement IMT in the entire 3 300 – 3 600 MHz band.

In Europe, the 3 400 – 3 800 MHz band is identified as the first primary band for 5G, which can be used to provide high capacity and coverage. According to the GSA, since 2015, 23 countries have auctioned or allocated C-Band spectrum (3 300 – 4 200 MHz) for mobile broadband³. For example, China already made the 3 400 – 3 600 MHz band (as well as additional spectrum within 2 GHz and 4 GHz) available for 5G, and commercial services were launched by two operators in November 2019; Japan issued licenses for 5G in 3 600 – 4 100 MHz in April 2019. Korea auctioned the 3 420 – 3 700 MHz band (as well as 26.5-28.9 GHz) in June 2018. The United States has issued a Notice of Proposed Rulemaking to enable mobile broadband (e.g. 5G) in 3 700 – 4 200 MHz⁴.

¹ Sub 1 GHz Spectrum for LTE and 5G, GSA October 2019

² Status of the LTE Ecosystem, GSA December 2019

³ C-Band Auction Snapshot, GSA January 2020

⁴ Spectrum for Terrestrial 5G Networks: Licensing Developments Worldwide, GSA August 2019



These various frequencies being made available for 5G in leading markets will be supported by a 5G “tuning range” which will cover the 3 300 - 5 000 MHz frequency range. The relevant 3GPP band classes are as follows:

n77	3300 MHz – 4200 MHz
n78	3300 MHz – 3800 MHz
n79	4400 MHz – 5000 MHz

From 5G trials, deployments and launches perspectives, there is a clear pattern of investment in bands n77 and n78 (3 300 – 3 800 MHz) according to a GSA report⁵.

In addition, for mobile operators to cost-effectively fulfil the market demand for 5G services; it is suggested that wide and contiguous frequency blocks be made available for IMT within the 3 300 – 3 600 MHz in South Africa; with 80 to 100 MHz of contiguous blocks per operator.

With the intent of the Authority to license 1x116 MHz in the 3 500 MHz band (3 428 – 3 544 MHz); Intel corporations would suggest that the Authority consider auctioning the entire 3 300 – 3 600 MHz band with 80 to 100 MHz of contiguous blocks per operator. The actual size of the assigned blocks should be determined by the auction procedure itself, with the channel raster based on 10 MHz lots.

3. Conclusion

Intel welcomes this opportunity to present its views on the ICASA “**Information Memorandum for International Mobile Telecommunications (IMT) Spectrum Assignment**”.

Intel believes that 5G is much more than IMT; and to enable 5G, current and next wave connectivity will be needed, and it will be integrating IMT (IMT-2000, IMT-Advanced, and IMT-2020), Wi-Fi, WiGig/mmWave and other wireless technologies. 5G will enable a diverse set of use cases and applications – each with different requirements in terms of spectrum. Therefore, to enable 5G there is a need to make sufficient spectrum available; including **licensed spectrum** (in low-band – below ~1 GHz (e.g. 700 MHz / 800 MHz band); mid-band – between ~2 – 4 GHz (e.g. 3300 – 3600 MHz); and high-band – above 24 GHz (e.g. within 24.25-29.5 GHz and 37-43.5 GHz)) as well as **license-exempt spectrum** (unlicensed spectrum in the 5 - 6 GHz band; and unlicensed spectrum accessed in the 60 GHz range).

Given the fact that, the first wave of 5G service deployments is using 5G frequencies for improved data throughput, leveraging existing 4G deployments for smoother migration to 5G; Intel supports ICASA's decision to make the 700 MHz / 800 MHz and the 2 600 MHz bands available for **LTE/LTE-Advanced deployment as soon as possible in 2020**.

The 3 500 MHz band (IMT3500), is a pioneer mid-band for 5G deployment; and from 5G trials, deployments and launches perspectives, there is a clear pattern of investment in bands n77 and n78 (3 300 – 3 800 MHz) according to the GSA. In addition, for mobile operators to cost-effectively fulfil the market demand for 5G services; a wide and contiguous frequency blocks should be made available for IMT within the 3 300 – 3 600 MHz in South Africa; with 80 to 100 MHz of contiguous blocks per operator.

⁵ GSA report on Global Progress to 5G - Trials, Deployments and Launches published in July 2019



Therefore, Intel corporations would suggest that the Authority consider auctioning the entire 3 300 – 3 600 MHz band with 80 to 100 MHz of contiguous blocks per operator. The actual size of the assigned blocks should be determined by the auction procedure itself, with the channel raster based on 10 MHz lots.