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**Mr Manyapelo Richard Makgotlho**  
**Project Leader**  
**ICASA**

**Without Prejudice**

**Per e-mail: [rmakgotlho@icasa.org.za](mailto:rmakgotlho@icasa.org.za)**

**Dear Sir**

**DISCUSSION PAPER ON THE DRAFT FRAMEWORK FOR DYNAMIC AND OPPORTUNISTIC SPECTRUM MANAGEMENT 2015, GAZETTE 39302**

1. Cell C would like to thank the Authority for the opportunity to provide written submissions on the discussion document on the framework for dynamic and opportunistic spectrum as published in *Government Gazette* 39302 on 19 October 2015.
2. Cell C appreciates the extension granted with respect to the due date for written submissions and looks forward to engaging with the Authority should the Authority have any queries on Cell C's written submission. As a result, we confirm our readiness to participate in any subsequent consultations that might be called by the Authority.

Yours sincerely

**Zolile Ntukwana**

**EXECUTIVE HEAD: REGULATORY AFFAIRS**

**CELL C DRAFT RESPONSE****DISCUSSION PAPER ON THE DRAFT FRAMEWORK FOR DYNAMIC AND OPPORTUNISTIC SPECTRUM MANAGEMENT 2015, GAZETTE 39302**

1. During October 2015 ICASA issued a document entitled "Discussion Document on Dynamic and Opportunistic Spectrum Management" which invited comment from stakeholders. Cell C considers this to be a professional piece of work. We do, however, have several concerns about the timing of and need for this work.
2. The rationale for the paper, based on research apparently conducted by CSIR and University of the Witwatersrand (WITS), is that *"The proposal broadly reflects recommendations made in the digital readiness pillar of the National Broadband Policy, SA Connect...The demand for wireless broadband capacity is growing much faster than the availability of new spectrum for supporting wireless infrastructure deployment. The National Development Plan and SA Connect advocate for broadband to reach "a critical mass of South Africans". To meet this demand, future generations of wireless technology and services will not only be required to increase their efficiency in terms of bits per second per hertz. They will also require new wireless network architectures and new approaches to spectrum management.... The discussion document is therefore aimed at introducing greater spectrum efficiency, a key requirement in terms of section 30(2) (b) of the Electronic Communications Act of 2005."*
3. Cell C understands the term Dynamic Spectrum Access (DSA) to describe a set of technologies and techniques that enable radio communication devices to opportunistically transmit on available radio spectrum. However, a brief review of other literature indicates that DSA is potentially more problematic than putting in place regulated sharing arrangements, for example, *"The higher power, opportunistic mode of sharing anticipated for the TV band "white spaces," is sometimes referred to as an "overlay" since the secondary user's access rights are overlaid on top of the primary user so as to exploit opportunities when the primary user is not actually utilizing the spectrum. While license-exempt usage – whether in dedicated unlicensed or on a secondary usage basis – provides a valuable opportunity for dynamically sharing spectrum, it does not*



*allow the license-exempt user to reliably control or predict the level of interference that may occur. Another approach to sharing is cooperative sharing, where the primary and secondary user agree on terms and conditions of sharing (i.e., what frequencies, what time periods, what prices)... Yoon [23]<sup>1</sup> performed a comparative study of different trading mechanisms (i.e., broker-based, auctions and direct trading). Her study found that provider's profits were superior under auctions while the subscriber's surplus was constant across all trading mechanisms. However, when considering the dynamic trading behavior under this mechanism, the research found that a large incumbent could monopolize spectrum in the absence of regulation. Using spectrum caps can address concentration, but this work does not address the possible deadweight losses associated with this intervention. Yoon's model suggests that direct trading provides a more active market with or without regulation.<sup>12</sup>*

4. Cell C agrees that achieving the goals of SA Connect is vital for development of broadband in South Africa. Without commenting specifically on the goals, it is by no means clear to Cell C how or even if DSA is going to address the provisions of the four pillars of SA Connect. It certainly cannot do so alone, and in the larger scheme of things, Cell C considers that the emphasis placed on and resources apparently allocated to this area may be misplaced, particularly at this time in our regulatory environment. Cell C notes that the spectrum policy directions to be issued by the Minister in terms of SA Connect for the assignment of broadband spectrum have not occurred. In the absence of such policy directions, the spectrum framework to enable operators to meet the broadband rollout targets is uncertain. This prescribed requirement is found under the section titled "*Digital Readiness*" and states the following: "*The DoC will also ensure that the impediments to broadband rollout are removed, by issuing the necessary policy directives to ICASA to expedite the assignment of broadband spectrum*"



<sup>1</sup> [23] Hyen-Young Moon, "Spectrum Management Policy Studies for Next Generation Wireless Industry: A Techno-Economic Approach," Seoul University, College of Engineering, Seoul, Korea. PhD dissertation 2009.

<sup>2</sup> Martin B.H. Weiss and William H. Lehr, "Market-Based Approaches for Dynamic Spectrum Assignment" accessed at [http://d-scholarship.pitt.edu/2824/1/JSAC\\_Weiss\\_and\\_Lehr.pdf](http://d-scholarship.pitt.edu/2824/1/JSAC_Weiss_and_Lehr.pdf) on 31 October 2015.

5. This is but one way and quite a limited way in which to deal with the goals and targets of SA Connect. The answers to Q1 is therefore yes. However, even if ICASA has accepted that progress in awarding high demand spectrum may be slow, it is worrying then that issues of spectrum pooling, trading and leasing are not also being considered and did not receive attention first, particularly given the still speculative success of DSA. The Radio Frequency Spectrum Regulations of April 2015 specifically foresee that these matters will be addressed by ICASA and may be possible. We do not have a view on Q2, Q3, Q4 and Q5 in the circumstances.
6. To alleviate spectrum shortages, this may well have been a more sensible activity than investigating DSA, simply because of the technicalities that will be involved in deploying what is called "cognitive radio" or "software-defined radios". We are not able to find texts emanating from either the EU, FCC or Australian regulatory authorities on this topic that are more recent than 2011 – the references by ICASA to the activities undertaken in various other countries do not directly address DSA or address it on its own (separately from TVWS). In these countries the process of determining alternatives to major focus areas (high demand spectrum allocation for broadband and digital migration) has been undertaken over a period of years (starting in the mid-2000s, with less work being done recently), and in fact none of them have yet been solidified for implementation. It is unclear, therefore, why ICASA would consider this initiative at this time and in these circumstances.
7. Cell C is also concerned with the inconsistent approach adopted by ICASA in this discussion document as compared to the approach adopted in finalising the IMT Road Map. In finalising the IMT Road Map, ICASA considered the following :

Cell C understands that the preliminary Radio Regulations emanating from WRC 15 for Region 1 is as follows:

*"resolves to invite ITU-R, after the 2019 World Radiocommunication Conference and in time for the 2023 World Radiocommunication Conference*

- 1 to review the spectrum use and study the spectrum needs of existing services within the frequency band 470-960 MHz in Region 1, in particular the spectrum requirements of the broadcasting and mobile, except aeronautical mobile, services, taking into account the relevant ITU Radiocommunication Sector (ITU-R) studies, Recommendations and Reports;*

- 2 *to carry out sharing and compatibility studies, as appropriate, in the frequency band 470-694 MHz in Region 1 between the broadcasting and mobile, except aeronautical mobile, services, taking into account relevant ITU-R studies, Recommendations and Reports;*
- 3 *to conduct sharing and compatibility studies, as appropriate, in order to provide relevant protection of systems of other existing services."*

Once the ITU 2015 Radio Regulations are finalised, Cell C recommends that the ICASA National Radio Frequency Plan is updated accordingly. ICASA is controlling, planning, administering, managing, licensing and assigning the use of the radio frequency spectrum, and it must comply with the applicable standards and requirements of the ITU and its Radio Regulations, as agreed to or adopted by the Republic, as well as with the national radio frequency plan, in terms of subsection 30(2) of the ECA. The discussion paper does not take these requirements into account.

8. In relation to Q6, the impact of implementing any of the approaches to flexible spectrum management has not been made clear in this discussion document. We understand that the purpose of the document is to solicit comment and perhaps in this way ICASA hopes to gain insight into whether or not this is a viable project. However, given that, as we say above, time and resources will already have been allocated to the research undertaken, we believe that demand for this type of arrangement should have been considered first and as a priority, existing demand for leasing, trading and sharing should have been addressed, along with the allocation of high demand spectrum. We are not able to address Q7.
9. We note that ICASA states *"It is important to note that as we reach the end of the first phase (i.e. 2015) progress has been limited with regard to addressing most of the constraints that have been identified as requiring attention in this phase. The following are the areas that the NDP identified as requiring attention, which are lagging far behind schedule and that the programme we are proposing seeks to facilitate:*
  - a. *Adjust the market structures and remove legal constraints to enable full competition in services.*
  - b. *Implement a service and technology-neutral flexible licencing regime to allow flexible use of resources in dynamic and innovative sectors, especially for spectrum that should be made available urgently for next generation services.*

- c. *Free up spectrum for efficient use, to drive down costs and stimulate innovation.*
- d. *Spectrum can be allocated with "set asides" or obligations to overcome historical legacies and inequalities in the sector, but this should not delay its competitive assignment.*
- e. *Identify alternatives to infrastructure competition through structural separation of the national backbone from the services offered by the historical incumbent to create a common carrier with open access policies to ensure access by service competitors."*

10. In Cell C's view, this discussion document and the work that has gone into it does very little to give effect to any of these 5 priorities, in fact one could say that DSA does not fall into any of these categories at all save perhaps for (c), which could be accomplished in several other more practical ways, which we have alluded to above. Our response to Q13 is therefore that this does not contribute to the objects of SA Connect.

11. As for Q8-19, we consider it unhelpful to address these matters at this time. Whilst DSA and TVWS are no doubt alternatives to the more traditional allocation and assignment of spectrum, the completion of the digital migration process would be a far more important project in our view, demanding more attention and a concerted effort by government and the private sector to enable the freeing up of spectrum for high speed broadband services. The allocation of existing and available bands (in the 2.6GHz range, for example) is also a far more critical project and deserves immediate and co-ordinated planning and execution.

12. Q20 is blank.

13. As noted above, given the other priorities which Cell C considers vital at this stage to address, we have not considered the possibilities set out in Q21-27. In due course, we look forward to participating in the consideration of these futuristic options, provided that the more immediate needs of the sector have been addressed, and the international models have become more concrete.



14. Our answers to Q28-30 are the same. We are also concerned that budget, time and human resources have been devoted to or are planned to be allocated to what seems to Cell C to be an entirely speculative endeavour.
15. The implementation of additional (and costly) technology and systems is accordingly in our view, misplaced, particularly when the systems are not yet tried and tested.
16. We are unable to answer Q31-52 at this time, save to note that the issue of devices is an important one (Q50). As device manufacturers are concentrating on devices for use in LTE and 5G networks, the likelihood of devices being able to work in the TWS or licence-exempt bands in the near future being widely available, or being superior or even equivalent to existing smart devices, is in our view, very limited. This naturally has an impact on take up by subscribers and returns for investors.
17. We are unable to address Q53-74 at this time for all the reasons set out above.
18. We urge ICASA to focus its energies and resources on the allocation of high demand spectrum; digital migration; and the possible leasing, sharing and trading of spectrum, which in our view would more immediately and more successfully address the goals of SA Connect.

