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22 January 2016

Mr Manyapelolo Richard Makgotlho  
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Dear Richard

**GSMA contribution on ICASA's Discussion Paper on the draft framework for dynamic and opportunistic spectrum management**

The GSMA would like to take this opportunity to commend the Independent Communications Authority of South Africa (ICASA) on its decision to publish a position paper on opportunistic spectrum management which we believe will clarify the expected use of many frequency bands in South Africa, including the High Demand Spectrum bands.

The GSMA would also like to thank ICASA for the opportunity to comment on its Discussion Paper on the draft framework for dynamic and opportunistic spectrum management.

The GSMA, which represents the interests of mobile operators worldwide, would like to submit the following answers to the questions in the Discussion Paper, for consideration during the consultation process. Whilst we identify with ICASA's reasons for considering the making available more license-exempt spectrum, we note that consideration for the use of license-exempt spectrum must not jeopardise the future of the UHF band, especially in the case of reallocation for exclusive mobile use. We therefore recommend focus on the more viable option of making the 700 MHz and 800 MHz bands available to provide wireless broadband services.

We request an opportunity to present at the oral hearing, if the Authority decides to hold one.

**Q1. Do you agree that ICASA has the appropriate legislative mandate to address the issues of dynamic and opportunistic spectrum management and TV White Spaces and to build a suitable framework? If the answer is no, please elaborate.**

Yes the GSMA agrees that both the Electronic Communications Act and the ICASA Act provide the ICASA with the due legislative mandate to manage the radio frequency spectrum and therefore to take appropriate steps to develop a regulatory framework to either allow or ban dynamic and opportunistic access to spectrum and TV White Spaces.

The GSMA would like to take this opportunity to commend the ICASA on its decision to publish a position paper on opportunistic spectrum management which we believe will clarify the expected usages of many frequency bands in South Africa, including the High Demand Spectrum bands.

**Q2. Are there any existing licensing models overlooked here?**

No there aren't, the licensing mechanisms listed are comprehensive.

**Q3. Do you have any comments about these four areas of spectrum reform?**

The GSMA has no specific comments to make regarding the reforms on Power Line Communications spectrum reform.

As for spectrum reforms aiming to make more licence-exempt spectrum available, we would like to point out that designating licence-exempt frequency bands should not deflect attention from the release of sufficient, exclusively licensed spectrum for mobile broadband. Exclusive access remains the main regulatory approach for mobile broadband spectrum, guaranteeing quality of service, safeguarding against interference and providing a higher degree of market certainty to create incentives for investments.

Additionally, for frequency bands above 50 GHz, the 2015 World Radiocommunications Conference (WRC-15) approved a new agenda item for WRC-19 which will consider allocation to mobile service and/or identification for IMT of the 45.5-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz frequency bands.

We therefore recommend that while considering frequency bands for licence-exempt approach, ICASA takes into account that these frequency bands will be studied for the next ITU study cycle (2015-2019).

**Q5. And in any other bands? Be specific, please, and support your recommendations.**

**Q70. Do you believe that Dynamic Spectrum Assignment should be applied to other bands, beyond the proposed TVWS operation? Please provide reasons?**

**Q71. If so, which bands should be considered next?**

Although we understand the reasons why ICASA is considering making more licence-exempt spectrum available (such as innovation, low investment networks, proven success of Wi-Fi technologies), we would like to underline that networks operating on licence-exempt basis deliver best-effort services as opposed to high Quality of Service (QoS), and barely provide guarantees that interference issues will not deter delivery of commercial services.

Therefore the GSMA is of the view that not all frequency bands are suitable to be designated as licence-exempt spectrum, especially frequency bands that are key enablers for universal broadband access, such as the 470-694 MHz frequency band. Our recommendation would be to release the 700 MHz and 800 MHz frequency bands using exclusive licensing with harmonised channel plans.

**Q6. Do you believe that the Dynamic Spectrum Assignment approach is viable and worthwhile?**

Whichever regulatory model is chosen (licensed or license-exempt DSA), the TVWS devices will share the 470-694 MHz band with not only existing users but also among themselves.

While DSA could appear as an innovative regulatory approach aiming to ensure the efficient use of spectrum, it should be stressed that interference management between users remains a top priority. The use of TV white space, even on a secondary basis, requires careful avoidance of harmful

interference with primary users such as existing TV broadcasters, as well as services in adjacent bands; and the Type Approval process is not sufficient to achieve this.

The GSMA believes that sharing responsibilities in case of malfunction of TVWS devices as well as network connections are key regulatory issues that need to be solved before expecting any deployment. Therefore, the Dynamic Spectrum Assignment approach will be viable and worthwhile only if it ensures coexistence between existing and future radiocommunications services – and not only reduction of interference as stated in the Discussion Paper - in addition to the increase of the use of radio spectrum.

**Q8. Does enabling the operation of TVWS contribute to the objective of ensuring efficient use of radio frequency spectrum?**

**Q9. Do you believe that it will also further objectives of encouraging investment and innovation in the electronic communications sector?**

**Q10. What are the benefits that could be expected from making TVWS available?**

**Q13. Does it support SA Connect goals regarding the deployment and adoption of broadband?**

**Q15. Could TVWS provide increased consumer value and/or improved social and economic inclusion?**

**Q31. From a South African perspective what will be the socio-economic benefits of TVWS?**

By enabling the use of the parts of the spectrum that are not used at a particular time and geographical location by TV broadcasters, the operation of TVWS devices will help to achieve the objective of ensuring efficient use of RF spectrum.

Nevertheless it is also important to consider whether enabling the operation of TVWS in the 470-694 MHz band is an effective way to use this band.

Furthermore, the GSMA is of the view that deployment of any system (including mobile systems) capable to access spectrum on an opportunistic manner might have a negative effect on investment and innovation in the electronic communications sector in general. Therefore this benefit is not specific to TVWS operations only.

**Q11. What are the disadvantages that could be expected from making TVWS available?**

**Q12. Do you foresee any risks?**

**Q16. What impact is the digital switchover expected to have on the use and availability of TVWS?**

**Q32. Will TVWS be of the most benefit to rural or urban areas? Please provide reasons – technical and socio-economic**

In addition to interference and coexistence issues that have been raised in Q6, the GSMA has identified the following disadvantages/risks:

- Failure of the TVWS business model due to the lack of white spaces

While there is currently a strong enthusiasm from some internet players who used to claim that great bunches of TV white spaces are available, it is worth noting that commercially desirable geographic

areas, such as major urban and suburban areas with high population and business densities, typically have little, if any, TV white space at all.

Furthermore, DTT is expected to boost TV content especially at local levels, leading to a greater use of UHF spectrum and therefore a lower availability of TVWS in rural areas. It is important to consider how to use the (current and future) Digital Dividend spectrum most effectively to benefit citizens and businesses, and discussions about TV white spaces should not derail this process.

- Market distortion

The GSMA is of the view that allowing the TVWS networks to operate on a licence-exempt basis would introduce distortions in market competition. Indeed eliminating the cost of acquiring licensed spectrum could create an unfair advantage.

We therefore recommend that an appropriate regulatory framework should be developed to ensure that market players are granted access to the same type of spectrum – in this case UHF spectrum (470 – 862 MHz) - through the same rules (licensing procedure, same type of licence, same spectrum pricing rules, etc).

- Future of the UHF band

As the sub 700 MHz band could be reallocated to mobile use in upcoming years, appropriate regulatory framework would need to be put in place to ensure that the use of TVWS will not jeopardise the future of the UHF band by mobile services. Allowing the use of TVWS in the UHF band could block or delay access to the sub - 1 GHz spectrum needed to deliver mobile broadband services and stay ahead of data demand.

Moreover, considering:

- 1) the recent developments on the sub 700 MHz band at WRC-15 which resolved to review the UHF band at the WRC in 2023
- 2) and the ongoing study, undertaken by the African Spectrum Working Group (AfriSWoG) of the African Telecommunications Union, on “the long term use of the UHF band”
- 3) the importance of releasing spectrum following a harmonised approach

the GSMA believes that TVWS operation should fall under a regulatory mechanism that will accommodate future radiocommunications services to be allocated in the 470-694 MHz band – such as mobile service - or future applications.

**Q14. What mechanisms should be put in place for dynamic spectrum assignment in meeting future demand for spectrum?**

The GSMA believes that the current available mechanisms are sufficient to assess future demand for spectrum.

**Q17. Do you believe white spaces should be utilised without authorisation or licensing?**

**Q18. Should there be rules for such usage?**

The use of TV white spaces should not distort the market through inappropriate regulation. As previously stated, eliminating the cost of acquiring licensed spectrum could create an unfair advantage to TVWS networks operators as compared to cellular-type mobile networks operators, leading therefore to an uneven playing field. Shared access to unlicensed spectrum could allow other players to deliver services comparable to mobile broadband with little or no outlay for the use of the spectrum, and fewer regulatory constraints.

The GSMA believes that white spaces should not be utilised without authorisation/licensing.

Moreover, TV white spaces should not be allowed to operate in licensed bands used by existing networks and infrastructures without the consent of the respective licence holders.

**Q19. Does the advent of TVWS have the potential to remove the existing “spectrum scarcity”, at least in some bands?**

Spectrum is a limited and scarce resource. Licenced use of spectrum, on an exclusive basis, has intensified the spectrum scarcity, leading to considerable debate and advocacy on ways to best address it.

Although we agree that the introduction of TVWS in the sub 700 MHz band will lead to an efficient use of this spectrum, we are of the view that this will not remove the existing spectrum scarcity. Indeed the 470-694 MHz band offers good geographic coverage, improved in-building coverage and reasonable capacity, making it an ideal band for various usages such as broadcasting, mobile and TVWS. As long as all competing demand will not be met in the band, the scarcity will remain. Furthermore, it is more likely that the demand for broadcasting and mobile services as well as various opportunistic applications will be concentrated where people live, thus increasing the spectrum scarcity.

**Q21. Is there a space for license-exempt, unmanaged use of TVWS?**

The 470-694 MHz band or part of it is currently used to provide broadcasting services in South Africa. Moreover, the adjacent band 694-790 MHz is used to provide mobile services. We believe that protection requirements for these existing services leave no room for licence-exempt, unmanaged use of TVWS, as registration of TVWS devices with the geo-location database is a minimum requirement.

**Q22. Is there a space for license-exempt, managed use of TVWS?**

**Q38. Do the benefits of adopting a licence-exempt managed assignment approach apply?**

**Q39. If a licence-exempt managed assignment approach is adopted, what registration requirement, if any, might apply?**

**Q49. Should the Authority require the registration of some or all devices? If only some, which devices?**

**Q50. Should mobile devices be obliged to have geolocation determination capability? How should the regulatory framework differentiate among devices types?**

**Q51. What rules should be attached to each type of device?**

**Q52. Should operating parameters differ by device type or technology?**

**Q65. On balance, do the potential benefits of permitting licence-exempt managed assignment TVWS devices outweigh any potential risks?**

Although most TVWS proponents advocate for this regulatory approach which is the one adopted by the USA, the UK and Canada, the GSMA is of the view that licence-exempt, managed use of TVWS is not an appropriate licensing model for TVWS in the context of South Africa – and Africa in general.

We believe that the sub 700 MHz spectrum is too valuable to be used on a complimentary basis, even to introduce new regulatory approaches that may - or may not – benefit the South African population. The socio economic value of licensing this spectrum, even on a secondary use basis, is

far greater than that of allowing devices to operate with no fee payable. It is also important to note that the opportunity for increasing engineering knowledge and competence in South Africa will remain even if the licensed approach is chosen.

**Q23. Is there a space for licensed use of TVWS?**

**Q24. If so, should licensed users pay the minimum annual fee, or a fee proportionate to use?**

**Q25. Does the combination give us the best of both worlds?**

**Q37. On what basis should white space use in the 470-694 MHz band be authorised?**

For the reasons stated above, the GSMA is in support of any regulatory approach that includes licensed model and excludes licence-exempt one. Thus, we recommend either light-licensed regime or fully licensed regime or a mixture of the two regimes.

As for annual fee, we recommend that the ICASA should not act in favor of any spectrum user by reducing – e.g. halving – spectrum fees for intrinsic capabilities (cognitive capabilities). It may be worth noting that it is the same cognitive capabilities that mobile networks use to optimize the use of assigned spectrum.

**Q26. Which of the licensing regimes do you favour? Why?**

The GSMA favours the mix of light-licensed and fully licensed regimes.

**Q27. Rank the licensing regimes in order of preference with reasons for your preferred order.**

| Ranking         | Regime   | Reasons  |
|-----------------|--|--|
| 1st             | Mixture of light-licensed and fully licensed regimes | <ul style="list-style-type: none"> <li>- will ease refarming if/when needed</li> <li>- will value the UHF spectrum</li> <li>- hierarchy</li> <li>- adaptability</li> </ul> |
| 2nd             | fully licensed regime                                | <ul style="list-style-type: none"> <li>- will ease refarming if/when needed</li> <li>- value the UHF spectrum</li> </ul>   |
| 3rd             | light-licensed regime                                | <ul style="list-style-type: none"> <li>- will ease refarming if/when needed</li> <li>- not enough value for UHF band</li> </ul>  |
| 4 <sup>th</sup> | License-exempt, managed regime                       | <ul style="list-style-type: none"> <li>- does not value UHF spectrum</li> </ul>  |
| 5 <sup>th</sup> | License-exempt, unmanaged regime                     | <ul style="list-style-type: none"> <li>- No protection of existing services in the same or adjacent bands</li> </ul>   |

**Q28. Do you see this as possible? Why / why not?**

**Q29. Does this provide a significant improvement on the status quo?**

**Q30. If some form of this approach is adopted, how should TVWS databases and TVWS database service providers be managed?**

**Q41. Should the white spaces database approach be adopted and or is there an alternative system?**

- Q42. What additional measurements should be adopted for greater accuracy?**
- Q46. What parameters should the Authority set forth for TVWS databases?**
- Q47. What criteria should be used to certify, recognise, or authorise TVWS databases?**
- Q53. Should transmit power levels be different for different device types?**
- Q54. Should the Authority consider a variable power limit which could increase the utility of spectrum for devices?**
- Q55. Should there be a maximum power output and what maximum power level should the Authority consider?**
- Q56. Should licensed devices be allowed a higher power limit than licence-exempt devices?**
- Q57. Recognising that allowing adjacent channel use would significantly improve spectrum utilization and increase the amount of spectrum available for use by TVWS devices, should the Authority permit TVWS devices to operate in channels adjacent to incumbent operations? Please substantiate**
- Q58. Are there any substantiated concerns regarding harmful interference associated with adjacent channel operation?**
- Q59. Should the Authority establish out of band emissions limits in order to improve spectral efficiency? If so, what are your recommendations to protect incumbent operators? What out-of-band emissions rules will best improve spectral efficiency and protect incumbent operations?**
- Q60. Should the Authority mandate a particular propagation model for database providers?**
- Q61. Which propagation model or models are most accurate for this application?**
- Q62. Which model or models maximise spectral efficiency?**
- Q63. Which models best protect incumbent operations?**
- Q64. Overall, what is the appropriate method of determining the required protection from authorised users in the TV bands?**
- Q66. Do the techniques discussed above adequately mitigate any interference potential?**
- Q67. Should we oblige every device to have GPS location capability?**
- Q68. In the US model, only latitude and longitude was required of GPS location. Is there any reason why we shouldn't demand full 3D location?**
- Q69. What about the situation where a fixed device is professionally installed with an external antenna and an internal unit. Should we accept the location details provided by the installer? Using what mechanism?**

The GSMA is in support of any interference mitigation techniques that would be used to ensure that existing in band and adjacent band users operate without experiencing harmful interference, should these techniques be automated or through human intervention.

To that extent, the database combined with geolocation systems could be a suitable solution. Geolocation with database access provide information about the temporarily unused/unoccupied spectrum and thus providing protection to incumbent services from harmful interference. In addition to the temporarily unused/unoccupied spectrum information, databases can also deliver the

protection requirements related to the use of those spectrum in certain locations such as, for example, the allowed maximum transmit power, exclusion and/or protection zones<sup>1</sup>.

However some issues should be carefully analysed before considering and authorizing database's implementation. In particular, the GSMA believes that access to the database should be based on a worldwide harmonized and standardized approach. The database needs to be appropriately designed, managed and correctly updated without transgressing confidentiality.

Furthermore, it needs to be considered that several key usages are based on indoor deployment and that geolocation based on satellite services cannot be used to correctly evaluate position.

**Q33. Please provide proposals on the regulatory framework (including none at all) for TVWS**

The GSMA would recommend that Regulators set a duration for the use of TVWS, applicable for whichever licensing model chosen.

**Q35. How should South Africa define TVWS?**

There have been concerns and controversial debates around how to define TVWS. This terminology issue was considered by the ITU Coordination Committee for Vocabulary (CCV) which decided not to include TVWS in the ITU terminology database. Instead it has been recommended to refer to terms such as "cognitive radio system", "software-defined radio" and "adaptive system" which have clearer definitions.

We therefore strongly recommend to bear this in mind while trying to define TVWS.

**Q36. How will the rules for non-compliance apply?**

Interfering WSDs should immediately cease transmissions.

**Q40. Do you think that licensed use of TVWS requires the operator to have an ECNS licence?**

As telecommunications companies that will use TVWS will need to deploy and operate their own physical network, we are of the view that they should be in possession of an ECNS licence according to the ECA. Furthermore, we think that a Class ECNS licence will best suit to the operation of TVWS networks as the availability of TVWS varies, depending on which district or local community is considered.

**Q43. Should the Authority allow – or require – sensing as an option at this time?**

Although there has been substantial evolutions on spectrum sensing techniques these last years, the GSMA believes that sensing technologies are still under development and not mature. Sensing approaches' impact in term of usage evolution should be carefully considered, in order to avoid any risk to sterilise part of the spectrum due to the limited possibilities to evolve the technology of the primary services and to introduce new primary services. We would therefore recommend that the Authority should neither allow nor require sensing as an option at this time.

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<sup>1</sup> Source: Annex 6 of the ITU Working Party 1B Chairman report on the meeting of Working Party 1B (GENEVA, 3-10 June 2015)

**Q48. How should the Authority approach issues such as non-discrimination, security, and quality of service?**

Allowing the TVWS networks to operate on a licence-exempt basis would introduce distortions in market competition. Indeed eliminating the cost of acquiring licensed spectrum could create an unfair advantage.

We therefore recommend that an appropriate regulatory framework should be developed to ensure that market players are granted access to the same type of spectrum – in this case UHF spectrum (470 – 862 MHz) - through the same rules (licensing procedure, same type of licence, same spectrum pricing rules, etc).

As regards to quality of service, we generally believe that competitive markets are best able to deliver the quality of service customers expect. Nevertheless, in order not to introduce distortions in market competition, the same quality of service requirements should be imposed on market players providing the same services.

**Q72. Are the study questions above the most relevant?**

**Q73. Are there additional study questions that you would propose?**

In addition to the above questions, it may be worth studying not only the current activities in the considered bands but also future activities as well as any long term planned use.

**Q74. Are there any additional devices or services in the 470-698 MHz UHF DTT band that should be considered in authorising use of TVWS?**

Services Ancillary to Broadcasting (SAB) and Services Ancillary to Programme making (SAP) will need to be considered as their usage is not predictable and will vary widely from day to day and from place to place.

The GSMA remains at your disposal to discuss any of these points in more details.

Yours sincerely



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