2.3 and 3.4 GHz Spectrum Award

British Sky Broadcasting Group plc ('Sky') Response

1. Sky welcomes the opportunity to respond to Ofcom's consultation and call for inputs on the 2.3 and 3.4 GHz spectrum release.

2. Sky supports Ofcom's moves to ensure more efficient use of spectrum. We also support the international move to make more spectrum available for data usage, and in particular licence-exempt spectrum, which we see as adding considerable value for consumers.

3. The award of this spectrum has the potential to impact significantly on the UK's ability to meet the growing demand for wireless data transfer. While the licensed use of these bands for mobile uses may enable operators to serve some of this demand, there is a greater risk that such use may constrain key services which currently operate on an unlicensed basis. In the case of Wi-Fi, the services afforded by this technology are likely to play a more crucial role in meeting future demand for mobile data than any newly licensed mobile services.

4. Therefore, while Sky broadly supports the move to free up the MoD spectrum, Ofcom must ensure that it does so in a way that does not significantly reduce the benefits that are derived from existing and potential future unlicensed use of these and other bands.

The release of this spectrum for licensed use should not constrain existing or potential benefits delivered by Wi-Fi

5. In many of Sky's previous responses to Ofcom, we have outlined our views on the future levels of demand for wireless data transfer, and the crucial role that Wi-Fi plays and will likely play in meeting this demand. In summary, the evidence suggests that mobile data traffic will continue to experience rapid and substantial growth. Wi-Fi already plays a fundamental role in the wireless data ecosystem as the primary technology which consumers use for data transfer. That role is only anticipated to increase as Wi-Fi helps meet this increased demand for wireless data, and in doing so increases the value of applications which make use of Wi-Fi significantly, and the benefit that the technology delivers to consumers.

6. Sky operates in-home, service provider and enterprise Wi-Fi. Our 5 million plus broadband subscribers extensively use Sky's wireless routers to access the internet via portable devices. And as a Wi-Fi hot-spot service provider via The Cloud, Sky is acutely aware of the importance of Wi-Fi in catering for consumers' mobile data demands out-of-home.

7. Ofcom studies have suggested that congestion and interference are already adversely affecting Wi-Fi performance. Sky would concur with this view, having experienced an increase in congestion in our service provider Wi-Fi as demand has risen. We anticipate that this will be mirrored in our in-home Wi-Fi, with more and more content being transferred in-home as customers seek greater flexibility, driven through product innovations such as Sky Go.

8. Together with recent and forecast increases in data traffic, there will soon be a clear need to increase substantially the amount of unlicensed spectrum available to meet the exponential growth of traffic expected over Wi-Fi for new diverse, innovative uses. It is therefore critical that release of the MoD spectrum is managed in a way that does not prevent this increase, or reduce the existing spectrum available.

9. Sky uses the 2.4 GHz band for in-home, service provider and enterprise Wi-Fi. Wi-Fi operating at 2.4 GHz currently delivers significant benefits to UK consumers, and any coexistence issues experienced as a result of mobile use in the adjacent 2.3 GHz band could significantly reduce these benefits.

10. Appropriate steps should be taken in the awards process to ensure that licensed use does not materially interfere with Wi-Fi operating at 2.4 GHz. We note that Ofcom is in the process of contacting Wi-Fi providers, and would urge an early publication of any Wi-Fi coexistence work that has been undertaken. Ofcom should also engage closely with industry in testing assumptions over power levels and protection ratios.

11. Once the full extent of any coexistence issues are known, Ofcom should assess whether there is likely to be any net data capacity gain at all from an increase in LTE spectrum, if the capacity of Wi-Fi is reduced through interference. Included in this assessment should be consideration of the detriment consumers will face from switching capacity from a free resource to a paid for resource that has lower prevalence on devices.

12. Subject to this analysis, Ofcom should take appropriate steps to mitigate any detriment, such as adjusting the guard band accordingly to reduce any interference, and including industry agreed parameters in the technical conditions of any eventual licence.

13. Sky has frequently encouraged Ofcom to take steps to ensure that sufficient spectrum in other bands is available for Wi-Fi use. Increasing the amount of 5 GHz spectrum available for licence-exempt use should be a priority as a first step. But as this may not be sufficient to meet the growing demand, we also consider that other bands should be explored in parallel.

14. Sky considers that the upper part of the 3.4 GHz band (as defined by Ofcom in this consultation) may have the potential to be utilised for Wi-Fi, and is concerned that the proposal to award this band to licensed mobile use will constrain its potential for licence-exempt use.

15. Ofcom should take full account of international developments in this band as it develops its award process. In particular, it is notable that the FCC is examining the liberalisation of spectrum in the 3550-3650 MHz band for small cell networks and spectrum sharing use, and considering extending this use into the 3.7 GHz band. As Ofcom's consultation notes, harmonisation of spectrum allows for greater economies of scale in respect of equipment, and leads to consumer devices that are able to work across national borders. Ofcom should therefore ensure that it takes full account of these developments when designing its award process and licence conditions for this spectrum.

16. In Sky's view, strong consideration should be given to low power, licence-exempt use in this band. We note that UK Broadband has been unable to utilise the spectrum it was awarded for widespread commercial deployment of services, in part because of the propagation characteristics of the frequency. A licence-exempt approach, with lower barriers to entry, may in contrast deliver significant benefits.

The spectrum release programme should also take account of the impact on PMSE use

17. The current 2350-2390MHz band is adjacent to bands that are extensively used for PMSE activities (primarily wireless cameras). PMSE also occupies other spectrum bands commonly used by the MOD. Availability of these channels will reduce as the MOD reuses spectrum more heavily following the release of 2.3 GHz and 3.5 GHz bands. This will make it increasingly difficult for PMSE to support the required level of coverage for

future events. In conjunction with developing its awards process, Ofcom should also ensure that sufficient attention is given to accommodating existing uses through new spectrum allocations.

18. We welcome the recent discussions with Ofcom and DCMS on this issue, and support the steps that have been made so far to give broadcasters such as Sky greater certainty of access. We are actively exploring the redeployment of our equipment at 2 GHz and 7 GHz.

19. However, we retain concerns that there will still be shortages for events with particularly heavy spectrum usage (such as the British Grand Prix). We look forward to working further with Ofcom in developing alternative approaches to this issue.

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