SONY

Sony Europe Limited
The Heights, Brooklands, Weybridge, SurreyKT13 0XW, United Kingdom
Telephone: +44 (0) 1932 816000 Fax: +44 (0) 1932 817000

Sony Europe's response to Ofcom's Consultation on "Future demand for mobile broadband spectrum and consideration of potential candidate bands"

Question 1: How much do you expect UK mobile data demand to change in the period 2015-2030? Please provide evidence for the trend and, where possible, please indicate how demand might vary across the device categories listed in paragraph 4.7. How should we account for factors (including pricing) that would constrain demand?

Data traffic demand is steadily growing 50-100% annually with a global CAGR on approximately 70% at least until 2020.

M2M traffic continues to provide just a small portion of total traffic in mobile networks, but it will grow dramatically in absolute terms from today's levels.

Question 2: What evidence do you think is relevant to assessing the extent of consumer benefits associated with meeting the increase in demand for mobile data?

No Comment

Question 3: What proportion of mobile data traffic do you expect to be carried over (a) Wi-Fi and similar systems in licence-exempt spectrum and (b) mobile networks in licensed spectrum? How do you expect this to change over the period 2015-2030 and how do you expect total data demand for Wi-Fi and similar systems in licence-exempt spectrum to change over the same period? How might this vary by location, environment etc.?

Most of the data traffic volume will be carried over WiFi. Many sources indicate some 60% of data over WiFi in the period 2017 – 2020, for example
http://www.fiercebroadbandwireless.com/story/thanks-wi-fi-only-40-mobile-data-will-go-over-cellular-2017/2013-04-10

M2M traffic will not be moving to WiFi. Any local area communications in M2M is likely continue to use other low power radio solutions such as Zigbee. The wide area cellular network would be the basis for all wide area M2M traffic. Again, this traffic is relatively much smaller in scale than personal mobile device data consumption driven by video, but it will be proportionally much more important in licensed spectrum.

Question 4: What factors will act to change the spectral efficiency of mobile technologies in the future? What spectral efficiency values are appropriate for consideration in our study for the period 2015-2030?

Remaining spectral efficiency features are now limited to aggregating RF channels and adding MIMO antennas (3x3, 4x4, 8x8, Massive MIMO, etc.)

Question 5: What service bit rate values are appropriate for consideration in our study for the period 2015-2030? What evidence do you have of changing needs for service bit rates?

Video traffic will totally dominate and the higher streaming quality (720P -> HD 1080P -> 4K) apply typical bit rates in the order of tens of Mbps although efficient codecs will be used (HEVC).

SONY

Sony Europe Limited
The Heights, Brooklands, Weybridge, SurreyKT13 0XW, United Kingdom
Telephone: +44 (0) 1932 816000 Fax: +44 (0) 1932 817000

M2M applications are expected to use very low, low and medium bit rates. The service bit rate in isolation is not an issue but the sheer number of devices puts constraints on control plane traffic, i.e. how many devices can be efficiently managed in the radio network.

Question 6: What proportion of traffic do you consider should be assumed to be carried on each cell types for the period 2015-2030? How will this vary with service environment i.e. between home, office, public areas, rural, suburban and urban? What evidence do you have of the factors affecting the uptake of small cells in licensed spectrum in the future?

No Comment

Question 7: Given the current mix of services on cellular networks what is the ratio of downlink to uplink capacity currently dimensioned for and how would you expect this to change over time by 2015, 2020, 2025 and 2030? How do you expect the ratio of downlink to uplink demand to vary for the service categories given in Table A5.4 of Annex 5, and what factors might affect this? How does this ratio of downlink to uplink capacity change (if at all) with network radio access technology and offload to licence-exempt systems?

DL vs UL ratio changing from 10/1 to 3/1 or lower when capacity and pro-sumer applications are growing (same trend as web 1995-2005).

M2M applications tend to have very different downlink to uplink ratio from human oriented traffic. In many cases the traffic is uplink oriented, where short requests for data in downlink are followed by data transmission in uplink. This would have a particular relevance for the service categories under very low rate data in table A5.4. With the estimates of M2M devices far outnumbering other mobile devices from 2020 onwards, this kind of uplink oriented low data rate traffic may constitute a considerable portion of traffic in sub 1 GHz spectrum macro cells.

Frequency ranges under discussion

Question 8: What are your views about the pros and cons of the frequency ranges in Table A6.1 in Annex 6 for mobile broadband and for existing applications using this spectrum? Do you have views on other bands that are not in Table A6.1?

The frequency band 470-694 MHz must continue to be used for DTT and PMSE for at least the next ten years. The recent analogue switchover process has led to a major investment in DTT Tx infrastructure. DTT has a large installed base of receivers and aerials supported by a wide choice of new receivers in all price ranges. There is also significant use of low cost indoor aerials in areas where signal strength is high. The DTT platform provides excellent quality of service, with good coverage at a low cost and with 51% of all UK TV sets used primarily for DTT reception it is difficult to see how an alternative solution could match such access to PSB content.

The allocation of 700MHz band for mobile broadband must be managed to ensure that issues such as interference to DTT, sufficient spectrum for PMSE and access for White Space Devices can be addressed in the appropriate time frame to allow relevant stakeholders to accommodate this change. We think comprehensive, technical studies into co-existence issues and the inclusion of an effective guard-band between DTT and mobile broadband services are key elements of the management process.

SONY

Sony Europe Limited
The Heights, Brooklands, Weybridge, SurreyKT13 0XW, United Kingdom
Telephone: +44 (0) 1932 816000 Fax: +44 (0) 1932 817000

Question 9: Are there any other bands that are not in Table A6.1 for which you think we should be considering their pros and cons for mobile broadband and for existing applications using this spectrum?

No Comment

Question 10: What are your views on bands which should be a priority for consideration for mobile broadband?

It's critical for economies of scale that mobile broadband frequency bands are harmonised with other regions (Asia, Americas, etc). Lower frequency bands are preferred and a wide frequency bandwidth is very suitable for > 2x2 MIMO advantages (e.g. 2700 - 2900MHz)

From M2M point of view the bands of interest are those below 1 GHz because of their favourable propagation characteristics for wide area use. This is the only way to provide cost effective, ubiquitous wide-area overage for low data rate M2M applications.