

## **Qualcomm's response to Ofcom Consultation "Improving consumer access to mobile services at 3.6 to 3.8 GHz"**

**November 2016**

### **Introduction**

Qualcomm welcomes the opportunity to respond to the Ofcom consultation on "Improving consumer access to mobile services at 3.6 to 3.8 GHz".

Qualcomm believes that 5G will transform societies and industries to an even greater extent than previous service generations. 5G connectivity will create new services, new industries and devices, and empower brand new user experiences via support of ultra-low latency, ultra-low power, ultra-high reliability and ultra-high security devices with flawless connectivity.

5G will be scalable and adaptable across an extreme variations in requirements and will be a unified design across all spectrum bands and types (licensed, shared and unlicensed) from below 1 GHz for wide area coverage deployments to higher bands up to 6 GHz for more capacity focused deployments, to above 6 GHz and mmWave for extreme bandwidth and more targeted capacity deployments.

Availability of spectrum is a key requirement to enable testing and early 5G deployment before 2020 and we do believe that the 3400-3800 MHz will be the the primary band in the spectrum between 1 GHz and 6 GHz for the introduction of 5G in Europe before 2020, as recommended by the Radio Spectrum Policy Group and in the EC Action plan.

Making spectrum in 3400-3800 MHz band available in 2017-2018 timeframe would allow the UK to be ahead for 5G roll-out and this would enable also the country reap the benefits of a leading country advantage.

**Question 2:** Do you agree with our identification of a trend towards the use of mobile in the 3.6 to 3.8 GHz band?

Yes, Qualcomm agree with Ofcom's identification of a trend towards mobile use of the 3.6-3.8 GHz band as well as the 3.4-3.6 GHz band. Furthermore, Qualcomm believe that 3400-3800 MHz band will be the primary band in the spectrum between 1 GHz and 6 GHz for the introduction of 5G in Europe before 2020:

- In its 'Opinion on spectrum related aspects for next-generation wireless systems (5G)', the RSPG "...considers the 3400-3800 MHz band to be the primary band suitable for the introduction of 5G use in Europe even before 2020, noting that this band is already harmonized for mobile networks, and consists of up to 400 MHz of continuous spectrum enabling wide channel bandwidth. This band has the possibility to put Europe at the forefront of the 5G deployment."
- In its Action Plan, the European Commission states: "...the 3.5 GHz band seems to offer high potential to become a strategic band for 5G launch in Europe."
- In April 2016, ECC PT1 sent an LS to 3GPP and ETSI informing on the progress of regulatory work for IMT-2020 / 5G spectrum in Europe, highlighting the potential for the 3400-3800 MHz frequency range in the context of 5G. Furthermore, in June 2016 ECC established a new Work Item and invited ECC PT1 to assess the suitability of the harmonized technical conditions of ECC Decision (11)06<sup>1</sup> to 5G. In September 2016, ECC PT1 agreed to send a LS to ETSI and 3GPP, seeking technical support and information with reference to the frequency range 3400-3800 MHz for introducing 5G technologies.
- This band is being considered for early trials and introduction of 5G services in a number of countries/regions in the world including China and Japan. The

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<sup>1</sup> ECC Decision (11)06 : "Harmonised frequency arrangements for mobile/fixed communications networks (MFCN) operating in the bands 3400-3600 MHz and 3600-3800 MHz" - <http://www.erodocdb.dk/docs/doc98/official/pdf/ECCDec1106.pdf>

3500MHz band in the U.S. and Korea might be good candidate too for 5G deployments – In the U.S. “The Mobile Now Act” proposes further studies for a number of bands including 3100-3550 MHz and 3700-4200 MHz

Also, the proximity of this band to existing bands used for mobile, the potential reuse of existing infrastructure in areas where dense networks are deployed, bandwidths considerably wider (in the order of 100 of MHz) than those of today that can assist to address 5G use cases in the short/medium term providing a combination of capacity and coverage making the 3400 – 3800 MHz range very attractive for 5G.

**Question 3:** Do you agree with our high level proposal to make 116 MHz within the 3.6 to 3.8 GHz band available for mobile and 5G services, bearing in mind our statutory duties and the high level trends we have identified?

Qualcomm welcome Ofcom’s high level proposal to make 116 MHz within the 3.6 to 3.8 GHz band available for mobile and 5G services and it does support Ofcom decision to put in place policies to stimulate a change in the landscape of current usage with the aim of maximizing the spectrum available for 5G to make it available more widely for citizens and consumers across the UK. In particular, Qualcomm believe that spectrum should be released in the 2017-2018 timeframe to allow 5G trials spanning eMBB, mission critical and IoT services paving the way for at least eMBB commercial rollout before 2020. However, Qualcomm does not believe Ofcom should auction the 3.4-3.6 GHz to the 3.6 – 3.8 GHz in a single auction if this would delay the auction of the 3.4-3.6 GHz band. Qualcomm agrees with an auction design based on 5 MHz blocks with the possibility for operators to purchase contiguous blocks without a cap in this band. This is important to allow operators, which wish so, to get access to wider contiguous spectrum of 100 of MHz. This will help reap the full benefits of this frequency band for 5G.

**Question 4:** Do you agree with our general approach regarding spectrum currently licensed to UK Broadband?

Yes, Qualcomm support Ofcom's proposals to change the regulatory conditions to UK Broadband's spectrum allocation to align it with the rest of the 3.6-3.8 GHz band.

**Question 6:** Do you have a view on any of the two options we identified?

Qualcomm supports option b) as it sees value in mobile being made available in this band across a much broader geographic area and potentially in some cases on a shorter timescale

Remove existing users' authorisation to transmit for fixed links and no longer take satellite earth stations with a receiver component in the 3.6 to 3.8 GHz band into account for frequency management purposes.