Scottish Futures Trust

3.8GHz to 4.2GHz: Opportunities for Innovation – Response to Call for Input

09 June 2016
1. Introduction

1.1 The following captures Scottish Futures Trust’s (SFT’s) response to the recent 3.8-4.2 GHz consultation issued by Ofcom. We consider that there are elements within the consultation on the use of 3.8-4.2GHz spectrum band which could have a significant impact upon mobile telecommunications and mobile data usage in Scotland. Its use, and particularly the considerations around spectrum sharing, needs to be considered in relation to the future requirements of Scotland’s and the UK’s telecommunications ecosystem and how it enables and supports the quality of experience for users.

1.2 In terms of telecoms infrastructure, SFT is working with Scottish Government (‘SG’) to develop an implementation strategy to deliver Scotland’s world class digital vision as described in SG’s Scotland’s Digital Future - Infrastructure Action Plan’1. For this vision to be delivered, it is imperative that both consumers and enterprises in Scotland have access to digital services and mobile connectivity to enable connection and content. This requires both infrastructure and devices to achieve:

- Seamless delivery across fixed and wireless platforms;
- A quality of service and experience commensurate with other leading and modern digital economies; and
- Investment into Scotland’s digital infrastructure that will guarantee the country’s future competitiveness, as well as its ability to provide enhanced public services and opportunity to its citizens.

1.3 A key aspect of this work is to assess the wide range of potential interventions that could be considered to enhance the opportunity for investment in digital infrastructure across Scotland. This includes UK and Scottish Government policy and regulation, as well as establishing the drivers that will stimulate efficient and effective private and public sector investment.

1.4 In Scotland the demand for data has increased significantly in recent years and with it the demand for seamless broadband and mobile connectivity. Anecdotal evidence, together with Ofcom and other studies, indicates however that the customer quality of experience is a mixed one. For some, there has been significant improvement in terms of superfast broadband and 4G coverage, alongside growth in the number and types of connected devices. This has largely been in urban and economic centres. For others however, regardless of geography, it is still one of unreliable, slow broadband and mobile connectivity services; this experience is replicated in both the consumer and business connectivity markets. There is therefore a strong case to establish how adequate investment and innovation can be delivered into those, primarily regional markets. Convergence has also changed how people access services, and indeed OTT content has grown exponentially over the last few years again for some. It is this experience that we want to see replicated across the country.

As we highlighted in our response to Ofcom’s Strategic Review of Digital Communications, it is recognised that Ofcom has applied certain remedies, but based upon consumer outcomes we suggest that there is significant scope for both Ofcom and the wider public sector to be increasingly proactive as regards driving market change and performance. We believe such approaches should be part of an overarching UK Regime, but should also address the needs and requirements of regional businesses and consumers. Ultimately, the ability to deliver an efficient, competitive telecommunications market for all will deliver significant benefit. To assess these potential benefits, SFT commissioned Deloitte to consider the impact of Scotland achieving its world class digital vision. The findings of the report captured the potential of such a vision in fiscal, economic and social terms. The report found that the potential benefits arising from achieving such a vision were significant in economic, fiscal and inclusion terms. Achieving a world class digital vision also improves a number of social dimensions: access to public services, greater social cohesion and inclusion and a reduced cost of living, amongst others. This includes looking at the potential benefits of increased digitalisation on services such as healthcare and education provision and services. As highlighted, the ‘prize’ of enhanced digital communications offers significant benefit, and indeed has the potential to significantly improve competitiveness, productivity and innovation.

From a digital communications infrastructure point of view, we have identified six key pillars that are key to Scotland’s digital environment being ready for a new generation of connectivity, 5G. The ITU has already defined that a 5G ready network will have to provide data speeds of up to 20Gbps. If Scotland is to be ready for this, it is imperative that it has the underlying infrastructure ready. Spectrum is one of those key pillars, and therefore its management and availability will be key to achieving this future vision.

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2 http://stakeholders.ofcom.org.uk/binaries/consultations/dcr_discussion/responses/Scottish_Futures_Trust.pdf

1.7 A proliferation of fibre connectivity will be critical. Copper infrastructure will not sustain a future ultra-high speed, resilient network and transit of information. The installation of this underground fibre will require working with different industries and local authorities to ensure adequate infrastructure is thought about when planning new developments or new buildings. Likewise, it is envisaged that there will be a higher concentration of small cell technology in the urban environment to deliver the headline speeds. This will need the co-operation of Government and local authorities to ensure an appropriate planning and policy framework. It is also essential that this is all supported by sufficient power, from the urban to rural areas.

1.8 As highlighted above spectrum will have a key role to play, however, this is not just about availability. Additional obligations that may come with new spectrum auctions should allow for ubiquitous 5G coverage from the urban to rural areas and drive the right products to use services in an affordable and accessible way. Ultimately, new advances in technology will require near instant information resource (latency of <1 ms) and will require that information be closer to the user. Scotland to achieve this world cannot rely on information being stored in internet exchanges in London or Manchester: it needs to be in Scotland. For Scotland, the six pillars provide a base upon which to consider the future world and ensures that it will be 5G ready when industry comes to its deployment.

1.9 The above frames our response to this consultation. We would welcome the opportunity to discuss further the points raised in this response with you and also to explore the potential to work with OFCOM on any demonstrator projects that emerge in relation to the use of this spectrum.

2. Consultation Questions

Question 1: Given the nature of the incumbents and their use of the spectrum, what new types of applications do you foresee could access this spectrum on a shared basis? Please
provide details on the potential applications and their characteristics of use as identified in the spectrum sharing framework.

1.10 Rather than necessarily at this stage creating new applications for the spectrum, we take the view that the availability of this spectrum range is the critical factor that will enable businesses and providers to behave in new and innovative ways. For example, the availability of spectrum at a Tier 3 level on an opportunistic basis should, depending upon the pricing point, allow for more flexible business models and to perhaps attract new players into the market. In a Scottish context we welcome the development of the market and the potential for new players to identify opportunities to increase the availability and coverage of mobile in the more rural and remote areas of the country. We recognise that there are limitations in the use of this specific spectrum band at present, and welcome the approach being taken by Ofcom in releasing the spectrum and encouraging innovative uses thereof. We can see the benefits of having increased capacity and more channels available for use in a more controlled manner and would encourage Ofcom to ensure that this is used in the most effective way, and pursue a ‘use it or share it’ policy for this and future spectrum releases (recognising that no Wireless Telegraphy Act spectrum licence is exclusive and Ofcom retains discretion to authorise multiple uses of licensed frequencies, for any purpose, in line with its statutory duties). We understand that, as there are incumbents, the RF kit exists to use this spectrum therefore a prolonged period of development for the physical technology to utilise the spectrum range should not be required, rather the development and innovation is likely to occur at the software level. We see great potential benefits of the frequency range in improving wireless backhaul use over point to point/point to multi point in more rural areas of Scotland, recognising the line of sight requirements of these particular frequencies.

1.11 Building on engagement with industry and academia we understand that the main benefits of having more unlicensed spectrum (based on geolocation) available are:

- Dynamic Channel Allocation;
- Dynamic Output Power Management; and
- Dynamic Channel Bonding (Width) Management.

1.12 Indicative discussions would suggest that the potential exists for use of this spectrum:

- At a Tier 1 level Backhaul Point-to-Point (PtP):
  - Enterprise Access;
  - Disaster recovery;
  - Leased line replacement;
  - Special events connectivity;
  - Traffic monitoring and control; and
  - Video surveillance.

- At a Tier 2 level Access Point-to-Multi-Point (PtMP):
  - 3G/4G offload;
- Border patrol;
- Disaster recovery;
- Leased line replacement;
- Rural connectivity;
- Smart grid advanced metering infrastructure (AMI);
- Special events connectivity;
- Traffic monitoring and control; and
- Video surveillance.

**Question 2: Based on information provided in this Section, can you identify any barriers to enhanced sharing in the 3.8 GHz to 4.2 GHz band? Please use the Spectrum Sharing Framework, which identifies four types of barriers to spectrum sharing: lack of information; market barriers; technology barriers; and authorisation barriers.**

1.13 We understand that potential exists for the lack of information to present a barrier for the use of the spectrum in an efficient manner, however we recognise that Ofcom are managing this much more effectively and therefore it shouldn’t represent an insurmountable hurdle to the spectrum use. Greater consideration by Ofcom may be needed in relation to spectrum access pricing. This could provide a market stimulus in an efficient manner. We would propose that the price should reflect the degree of guarantee for utilisation of the spectrum and that it is tiered accordingly, perhaps to the point where it is free of charge at the opportunistic Tier 3 level. In so doing, this could generate new and innovative business cases in the market and develop a new market and offer the potential for the longer term economic and social value to be more fully realised. It is understood that if this was the basis at the Tier 3 level there would be associated risk of congested spectrum, in which a deferral to Tier 1 and Tier 2 licence owners would be accepted as a market/business risk. The pricing must be set at a level which does not devalue the spectrum to existing incumbent licence holders.

1.14 At a technology level, a barrier/risk could be that if the UK is the only nation to release and use this spectrum band that the providers of handsets or other technologies may not develop the chip sets capable of utilising the spectrum as there is no compelling business case/market for them to do so. Greater collaboration with other major countries in respect of harmonising spectrum would therefore be seen as beneficial to address this potential barrier.

**Question 3: Do you agree with our initial assessment of a potential application of a tiered authorisation approach in this band?**

If yes, please provide as much detailed information as possible of how you consider any tiered authorisation approach may enable greater spectrum sharing and how it could be implemented in practice.

1.15 We agree that a tiered authorisation approach would be a suitable way in which the spectrum could be allocated. As stated in our response to question 2, the tiered approach will only work effectively if careful consideration is given to the price point at each Tier. The expectations of a Tier 1 and Tier 2 licence holder must
be that they will have first rights over the use of the spectrum and that it will be available when needed. By association, Tier 3 users will be able to work opportunistically but will need to carefully consider the risks associated with this and plan their business models accordingly.

**Question 4:** Should a potential future tiered authorisation approach to spectrum access in the 3.8 GHz to 4.2 GHz band accommodate changes from incumbent services of the spectrum? I.e. should new licences or variations to existing fixed link and satellite earth station licences be allowed to continue on a first-come-first-served co-ordinated basis?

1.16 We consider that, at present, the first-come first-served approach works appropriately and do not believe that this needs to change, however, we have genuine concerns over ‘spectrum-banking’ and the duration of access to the spectrum. We would consider it an opportunity missed if participants were able to procure licences for spectrum in this frequency with no intentions to use it in the near future, thereby cutting off other potential users and potential to innovate. As previously stated, the licences should be granted very much on the basis of ‘use it or share it’ in mind and Ofcom should reserve the right to revoke licences should this be found to not be taking place. We believe that consideration should also be given to the length of time for which the licences are in place – i.e. that they cannot be kept indefinitely if no discernible use has been found for them. It may be the case that a different approach to the allocation/auction of spectrum is required at some point in the future however, at this stage we consider the approach to sensible, notwithstanding the need to ensure that it is regulated for the most effective long term benefit of users.