

TELEFÓNICA UK LIMITED RESPONSE TO:

**“FUTURE DEMAND FOR MOBILE BROADBAND SPECTRUM AND CONSIDERATION
OF POTENTIAL CANDIDATE BANDS:
World Radio Communication Conference 2015 Agenda item 1.1”**

29 APRIL 2013

I. INTRODUCTION

1. Telefónica UK Limited (“Telefónica”) would like to thank Ofcom for giving stakeholders the opportunity to input to their work on future demand for mobile broadband spectrum and consideration of potential candidate bands under World Radio Communication Conference 2015 (WRC-15) Agenda item 1.1. We will, of course, also take the other opportunities to input to the UK WRC-15 preparatory work that Ofcom offers through its established stakeholder groups.

II. GENERAL COMMENTS

2. Telefónica believes that the UK will have to continue to take a sufficiently long term view to ensure that the significant infrastructure investments required to support growth can be made. Spectrum is essential for the digital society, fast wireless services, economic recovery, growth, high-quality jobs and long-term UK competitiveness. Wireless industries can, and will, contribute significantly to the European region’s economic recovery. It is important to us that Europe remains competitive when compared to other regions of the world. Telefónica plans to invest billions of pounds over the next few years and the right approach to the development of UK positions and negotiating lines for WRC-15 preparatory work will encourage us to retain the current high level of investment in the UK and Europe.
3. It should be noted, however, that our income is finite and limited; although we have seen the demand for services rise by a factor of more than 30 in recent years, our revenues have decreased. As stated in our previous responses to Ofcom and other European consultations, this explains the increasing focus on cost, on investment, and on the need for regulatory authorities to avoid taking money away from investment programmes through poorly designed spectrum auctions. When assigning spectrum, national authorities should not design auctions to raise large amounts of money to address budget deficits as this simply decreases the amount of money available in private enterprises to invest in modern electronic communications networks. There should be a focus on investment, not on tax, and we continue to encourage authorities to consider alternative methods of spreading the cost of spectrum rights over time.
4. With regard to the roadmap of steps that need to be undertaken to ensure the availability of spectrum for mobile broadband applications, Telefónica agrees that WRC-15 will be important as it considers options for new frequency ranges suitable for mobile broadband and identifications for International Mobile Telecommunications (IMT). We note that some of the frequency ranges being considered are quite limited in their potential, and it will be beneficial for Ofcom to take into account the scope for each potential band to deliver real benefits.

III. SPECTRUM STRATEGY

5. Telefónica is pleased to note that Ofcom will be undertaking a refresh of its spectrum management strategy now that the Spectrum Framework Review (SFR) programme has completed most of its major tasks. We also note that the longer-term roadmap for the

provision of spectrum for mobile data needs to take into account trends that extend to at least 2020. The trends that Telefónica has seen in recent months with the phenomenal uptake of Mobile Broadband (MBB) confirms that more spectrum will be required for mobile services, in both high and low frequency bands, as the bandwidth per user increases, and it is our expectation that this trend will continue beyond 2020. A long-term view (10+ years on end user requirements, technologies and markets) is therefore needed. We support Ofcom's intention to address the strategic challenges facing the UK and Europe regarding the growing demand for spectrum over a 10-15 year period (i.e. to 2030). In particular, the focus should be on the economic benefits that different frequency bands could offer Europe as a whole.

IV. SPECTRUM DEMAND PARAMETERS

6. The Call for input requests views (§4 p.12-15) regarding various spectrum demand parameters. Our customers are demanding an increasingly wide range of services, with a high focus currently on social networks, hyper-connectivity and machine-to-machine communications. These content rich services require a transformation of existing networks from voice enabled communications to high data traffic enabled ones. Telefónica agrees with Ofcom that downlink traffic is likely to be higher than uplink traffic, but we note that spectrum efficiency in the downlink will remain much higher than in the uplink, and that this will help to mitigate against traffic asymmetry. We also acknowledge the contribution that small cells and Wi-Fi can make to the delivery of data traffic in a mobile network. Telefónica also agrees with Ofcom that the trend in increasing technological efficiency will continue, with ever-increasing data rates being delivered. However, we believe that the rate of increase will be much slower than the increase in demand for delivery of content rich services. This therefore means that we will still require additional spectrum to be made available in the coming years.

V. FREQUENCY RANGES

7. Telefónica continues to participate actively in the relevant ITU-R and CEPT groups and we understand the fluid nature of frequency range and candidate band proposals. Where additional unpaired (TDD) spectrum is proposed, Telefónica recommends that new allocations of unpaired spectrum blocks should offer at least 100MHz of usable spectrum. Similarly, for paired spectrum, Telefónica recommends that new spectrum bands should offer at least 2x40MHz of usable spectrum, in order that these additional frequency bands both support multiple operators and prove to be attractive enough for manufacturers to develop equipment.
8. Telefónica notes the frequency ranges listed in the Call for input (§5 p.18), and would like to take this opportunity to comment on what we consider to be the most important:
 - 700MHz: Telefónica believes that the 694-790MHz band should be allocated to the mobile service from 2015, in line with the provisional allocation made at WRC-12, and should subsequently be designated and made available for wireless broadband in a harmonised way in the European Union. We note Ofcom's separate call for input on the future use of the 700MHz band. Currently, we have no firm opinion about the

implementation timescale for the 700MHz band, but believe that every effort should be made to maximise the amount of usable spectrum for wireless broadband within the band. We also note that there could be additional benefit in ensuring that the lower boundary aligns and is fully compatible with the lower edge of 3GPP Band 28, both in terms of its frequency (698MHz) and its out-of-band emission mask, since that Band plan is to be used in many countries in Latin America and the Asia-Pacific region. This would open up the possibility of near-global harmonisation of any additional spectrum released for the mobile service following the future study of convergence noted above.

- **L-Band:** The 1300-1400MHz and 1427-1527MHz bands have the potential to offer more than 2x40MHz of usable spectrum. Telefónica considers that efforts should be made to ensure any interim decisions made in Europe, for example regarding the 1452-1492MHz sub-band, which has already been awarded in the UK, do not result in the fragmentation of the long term L-Band spectrum opportunity that could result from the rationalisation and extension of the two additional sub-bands already subject to CEPT harmonisation in Recommendation T/R 13-01. We acknowledge the need to protect the passive service in the 1400-1427MHz band.
- **2GHz MSS:** Telefónica notes that the 1980-2010/2170-2200MHz bands have yet to prove to be a commercial success and that there is the potential for this spectrum to be of value to terrestrial mobile broadband given its adjacency to the 3GPP Band 1 spectrum. If future actions taken by Member States relating to Decision 2011/667/EU result in the withdrawal of licences, we believe that Europe should consider re-allocation of the bands to the terrestrial mobile service.
- **2300MHz:** The 2300-2400MHz band is already standardised by 3GPP as Band 40 and has been licensed in several countries in the Asia-Pacific region. Wireless broadband equipment is already available and this makes the spectrum potentially attractive in Europe, and we note the current Ministry of Defence (MoD) plans to release part of this spectrum in 2013/14. However, given the strategic governmental usage of this band in some European territories, Telefónica believes that this band will only prove to be useful in the long term if these partial release and shared access mechanisms prove to be predictable, certain and not too onerous. We consider that most services currently being provided over radio spectrum need individual rights to be granted in order to ensure an appropriate quality of service by avoiding the threat of harmful interference, and that this puts limits on the applicability of the Licensed Shared Access (LSA) approach to sharing spectrum. Telefónica continues to follow the ongoing work on this topic in the relevant CEPT project team and RSPG working group.
- **4GHz:** The 3.8-4.2GHz band may be of interest in the very long term, but Telefónica considers that further work is needed first to promote the use of the 3.4-3.8GHz band for wireless broadband applications within Europe. This includes the release of additional spectrum in the UK, as planned by the MoD in 2015/16.

VI. SUMMARY

9. When developing the longer-term roadmap for the provision of spectrum for mobile data in the UK, Telefónica believes that Ofcom should take into account the current varied use of potential future wireless broadband spectrum bands across the European Union. Our summary comments on what we consider to be the most important frequency ranges for the roadmap for the future supply of spectrum.

Description	Frequency Band	Summary
700MHz	694-790MHz	<ul style="list-style-type: none"> • Allocate to the mobile service from 2015 • Subsequently designate and make available for wireless broadband in a harmonised way • Maximise the amount of usable spectrum • Align and ensure full compatibility with 3GPP Band 28 • No firm implementation date currently
L-Band	1300-1400MHz and 1427-1527MHz	<ul style="list-style-type: none"> • Ensure that any interim decisions made do not result in the fragmentation of long term spectrum opportunity • Protect the passive service in the 1400-1427MHz band • 1452-1492MHz already awarded
2GHz MSS	1980-2010 / 2170-2200MHz	<ul style="list-style-type: none"> • Potentially valuable as adjacent to 3GPP Band 1 • If future actions result in the withdrawal of licences, consider re-allocation of the bands to terrestrial
2300MHz	2300-2400MHz	<ul style="list-style-type: none"> • Standardised and licensed in several countries • MoD plans to release part of this in 2013/14 • Useful in the long term if shared access mechanisms prove to be predictable, certain and not too onerous
4GHz	3.4-3.8GHz 3.8-4.2GHz	<ul style="list-style-type: none"> • Further work is needed to promote the use of 3.4-3.8GHz • MoD plans to release part of this in 2015/16 • May be of interest in the very long term