Evidence for the Select Committee on Communications re
Will superfast broadband meet the needs of our "bandwidth hungry" nation?
From Robert Kenny, 9 March 2012

Introduction

1. My name is Robert Kenny. I am a founding director of Communications Chambers, an advisory firm specializing in telecoms and media strategy and policy.[1] My clients are regulators, policy makers, trade bodies and corporations in the UK and internationally. I have held senior roles in various consulting firms and also headed strategy and M&A for Hongkong Telecom and Reach (large Asian telcos), and headed M&A for US-based Level 3, the world's largest internet backbone provider.

2. I have written extensively on issues related to the societal case for superfast broadband, both in academic journals and otherwise. I have presented my views to various conferences, and to a large group of Australian MPs. References for some of these papers and presentations are available at the end of this evidence.

3. In this evidence I first make some general observations, in part responding to explicit and implicit assumptions in the call for evidence. I then provide responses to many of the questions raised by the Committee. I offer this evidence in a personal capacity.

General observations

4. Conventional wisdom is that superfast broadband to the home brings wider societal benefits, externalities that justify government intervention to support its availability and adoption. However, my research (initially from a neutral standpoint) has led me to the conclusion that conventional wisdom may be in error. Very frequently, the evidence offered for such benefits turns out to be surprisingly weak, or simply not relevant.

5. A first critical point is that superfast has no inherent value – rather, it is a means to an end. Any form of broadband is only as valuable as the applications it delivers. The case for superfast must be made on the basis of the applications it delivers. Moreover, the applications must pass three tests to be relevant: (i) they must be applications relevant to the home; (ii) they must be applications that depend on superfast, and not deliverable over basic broadband; and (iii) they must be applications with externalities.

6. Applications must be relevant to the home firstly because most businesses already have high speed connections available to them (though they may or may not pay to use them) and secondly because the great majority of the cost of widespread roll-out is associated with taking fibre to residential neighbourhoods. Remote surgery may be an exciting application, but it cannot be used to justify digging up suburban streets to deliver superfast to homes.

7. Applications must depend on superfast, because basic broadband (with limited but important exceptions) is widely available. If an application can be delivered over basic broadband it is a simple error of logic to use that application to justify superfast. There is no need to spend the

---

[1] Further information available at www.commcham.com

extra money to get the benefit of that application. However, it is an error that is frequently made. For instance, smart grids (which have the potential to reduce electricity consumption) are often cited as a reason to roll out fibre.[2] But smart grids use very little bandwidth, and have already been rolled out using conventional fixed and wireless connectivity. Telemedicine is another example. There are many medical applications that are perfectly feasible over basic broadband, including remote monitoring, videoconferencing and so on.

8. Applications must have externalities since otherwise there is no reason for the government to intervene. Superfast networks are expensive, and outside densely populated areas (where unit costs are lower) most consumers are unwilling to pay the full commercial cost. The same might be said of BMWs or Rolexes, but governments do not seek to subsidise such goods because they do not bring wider societal benefits. However, many of the applications cited for superfast appear to be similarly lacking in such benefits. HD or 3D TV on demand is often mentioned, but it is very unclear how society benefits from my viewing of *Avatar* in 3D. If other citizens don't benefit, why should they as taxpayers be asked to subsidise my viewing enjoyment? We certainly do not provide similar subsidies for satellite TV, for instance. The societal case (or otherwise) of such high bandwidth entertainment is particularly important because it is one of the few applications that may actually critically depend on superfast speeds.

9. Sometimes the argument for superfast is made not on the basis of applications, but rather on the more general basis that demand growth has been rapid, and is likely to continue ever upwards. There are two problems with this argument.

10. Firstly, robust demand growth would normally be seen as an excellent commercial opportunity, rather than a rationale for government intervention. If however it is demand that consumers are unwilling to pay full price for, it begs the question why the government should value that demand more highly than consumers do themselves.

11. Secondly, it seems to be very risky to presume bandwidth demand growth will carry on at historic rates. Past growth has been driven by three factors: (i) the number of internet users in a given house; (ii) the amount of time each of those users spend online; and (iii) the bandwidth used when online.

12. The first two are clearly finite. There are only so many people per house, and so much time in the day, and we may already be approaching 'saturation' on these two dimensions. (There are households that are not online at all, but that is a separate issue). Bandwidth use when online has been growing over the last decade as pictures, applications and video have been added to the original text internet. This has (primarily) involved moving existing media online. The next step change upwards in consumption will depend increasingly on material that does not yet exist in material quantities, such as 3D video, or possibly changes of behavior to, say, HD video conferencing. This is significantly more speculative than simply adding existing photos to a website. In combination these factors suggest that simply carrying forward historic bandwidth growth rates may substantially overstate future demand.

---

[2] See for instance European Commission, *European Broadband: investing in digitally driven growth*, October 2010

13. Moreover, projecting forward historic growth rates can suggest bandwidth needs that are very hard to reconcile to actual applications. The average household size is 2.5 people. Even a household of four people, each simultaneously watching their own on-demand HD video stream (presumably a rare scenario) has a bandwidth requirement of 20 Mbps – far lower than the EU 100 Mbps target, and well within the capability of fibre-to-the-cabinet technology.

14. Finally, the capabilities of the current copper infrastructure are constantly improving. This further narrows the set of applications that depend uniquely on fibre-based solutions, and creates the risk that significant money will be spent overbuilding the copper, when in fact the copper would have been well capable (in a relatively short time frame) of providing the necessary bandwidth.

15. While I am skeptical of the externalities of superfast broadband, I should emphasise that I am *not* skeptical of the benefits of basic broadband. The ability to access government and commercial services online, to be in email contact with friends and family, to telecommute and so on is clearly substantial. Ensuring widespread availability of basic broadband, and encouraging its uptake where it is already available, are both highly desirable.

Responses to questions

What is being done to prevent a greater digital divide occurring between people who can access superfast broadband and people in areas where the roll-out of superfast broadband may not be commercially attractive?

16. We accept a wide range of divides between urban and rural areas (very roughly speaking, the split between those with and without access to superfast broadband). Those in cities have lower ambulance response times, more choice of schools, better access to public transport and so on. Those in the countryside have cleaner air, more space and so on. We do not seek to equalise between city- and country-dwellers on all these dimensions, and it is not clear why superfast broadband should particularly be the target of significant expense to avoid a 'divide' – all the more so because the externalities of superfast are so unclear.

How does the UK communications market vary regionally and what is the best way to connect the areas that the market alone cannot reach? Is a universal service obligation necessary to avoid widening the digital divide?

17. A universal service obligation at any speed approaching 'superfast' would carry substantial cost to the country as a whole, in my view an unjustified expense, in part for the reasons set out above. Ofcom has described the rationale for the existing basic telephony USO as follows:

> "[It] provides services to help vulnerable customers and customers in remote and rural areas, … allowing them to take their full part in the economy and society. In addition, all citizens benefit by having a larger telephone network; they can contact and be contacted by more people".[3]

18. There is simply no case today to argue that superfast is necessary for citizens to 'take their full part in economy and society', and nor is there a case that such necessity is likely to arise in coming years. The starkest evidence for this is the relatively low take-up of superfast where is

---

[3]Ofcom, *Review of the Universal Service Obligation*, 30 June 2005

already available. Further, the network effect that Ofcom refers to (the benefit to all citizens from a larger telephone network) is also far less relevant to superfast, since it will primarily be used for communications between the household and a server, not between servers – unless 3D videoconferencing becomes a critical social tool.

The Government have committed £530 million to help stimulate private investment – is this enough and is it being effectively applied to develop maximum social and economic benefit?

19. If the government has money to invest in broadband, I believe it is best focused on (i) supporting the 2 Mbps target; and (ii) encouraging the adoption of broadband where it is available. The benefits of going online in the first place (for someone currently not using the internet) are substantial, and it seems likely are far greater than those from improving the access speed of someone who is already using the internet. Moreover, it seems at least plausible that the former is actually cheaper than the latter. Countries such as Korea and Portugal have run successful programmes to encourage take-up of the internet. With the honourable exception of the (slimly funded) 'Race Online' programme, the UK has made only modest efforts in this area.

Will the Government's targets be met and are they ambitious enough? What speed of broadband do we need and what drives demand for superfast broadband?

20. For the reasons above, I believe the Government's targets are *too* ambitious. The speed of broadband we need depends on who 'we' is. Large households with an enthusiastic demand for on-demand HD TV might need tens of Mbps. However, if the question is how much we as a society need – that is, the level of bandwidth that brings real externalities as opposed to purely private benefits – then I would suggest that answer is significantly lower.

21. The evidence from overseas markets is that the key driver for superfast adoption has been aggressive pricing. In order to achieve meaningful penetration of fibre, markets such as Hong Kong, South Korea and Japan have had to price superfast at a very moderate or even negative premium to copper based technologies. Moreover, demand for superfast appears to be saturating in some of these markets. For instance, in Korea penetration of 100 Mbps services appears to be saturating at a little over 30% of households[4], despite the aggressive pricing.

22. As to which applications driver superfast, it is one of the puzzling aspects of the debate over superfast that it has been available for many years in Asian markets, and yet there are no obvious examples of applications being developed there that critically depend on superfast. Fibre advocates lament that their markets lag East Asia, but do not seem to be able to identify what tangible benefits superfast in these markets has brought.

In fact, are there other targets the Government should set; are there other indicators which should be used to monitor the health of the digital economy?

23. I would argue that uptake of basic broadband is far more important than availability of superfast.

What communications infrastructure does the UK ultimately need to remain competitive and meet consumer demand over the next 20 years?

24. There is an important distinction between these two questions. It is possible that there will be consumer demand for superfast. This of course does not mean government intervention is

---

[4] See Malcolm Turnbull, *Korea's Broadband: An overview and implications for Australia*, June 23, 2011

required, any more than it is for thousands of other products where consumer demand outstrips willingness-to-pay. For competitiveness, I suspect strong wireless data services likely have greater importance to businesses than faster broadband speeds. At a per-firm level, there is evidence that the latter makes little difference for most businesses.[5] Moreover, nations that lead in the internet economy, most notably the US, do not actually have particularly high broadband speeds. The US ranks 16th, well behind markets such as Latvia, UAE and Belgium, all of which are in the top 10 for average peak connection speed.[6]

How will individuals and companies use cloud services for distributed storage and computation? What network properties are required to enable efficient provision and use of such services?

25. Cloud services are not new. One of the first was Hotmail, a cloud-based email service launched in 1996. Today they are used for a wide variety of applications, such as accounting (eg Freeagent), sales force management (salesforce.com), file storage (eg Dropbox) and word processing (Google Docs). Superfast broadband has not been necessary, though faster broadband (and lower latency) will bring moderate enhancements.

To what extent will the advent of superfast broadband affect the ways in which people view, listen to and use media content? Will the broadband networks have the capacity to meet demand for new media services such as interactive TV, HD TV and 3D content? How will superfast broadband change e-commerce and the provision of Government services?

26. HD TV is not a very high bandwidth application. Typical needs are 4-6 Mbps, well within today's average UK broadband speed of 7.5 Mbps.[7] Interactive TV doesn't need higher bandwidth than normal TV. 3D TV does require higher speeds, but is of course a nascent and unproven market.

27. Most e-commerce and Government services will be little changed. Tax returns or driver's licence applications are unlikely to benefit from 3D video, and nor is most e-commerce. Video by its nature is less interactive – it tends to be passively consumed. Thus it is simply less relevant to interactive activities such as e-commerce and government services. (Very high end video brochures for certain products may be a partial exception).

Will the UK's infrastructure provide effective, affordable access to the 'internet of things', and what new opportunities could this enable?

28. Since machines watch little video, the internet-of-things is relatively low bandwidth. For instance, the requirement per household for electricity smart grids (even those involving separate meters for multiple devices in the home) is measured in Kbps, not Mbps. For reasons of in-home connectivity, there are also substantial advantages to wireless over wired solutions. Thus, while the internet-of-things has great potential, it is not a strong argument for superfast broadband.

How might superfast broadband change the relationship between providers and consumers in other sectors such as content? What aspects of this relationship are key to enabling future innovations that will benefit society?

29. [No comment]

---

[5] See for instance A. Grimes, C. Ren & P. Stevens, *The need for speed: impacts of internet connectivity on firm productivity*, Motu Economic and Public Policy Research, October 2009
[6] Akamai, *State of the Internet*, Q2 2011
[7] Ofcom, *Infrastructure Report*, 1November 2011

30. Governments should be careful about being prescriptive about technology, not least because it is developing so fast. The UK has done well in this area, for instance avoiding a dogmatic favouritism for fibre to the home (unlike some other countries). This has proven wise, as the capabilities of the existing and far cheaper copper infrastructure have improved dramatically. BT have recently announced[8] that they plan to use existing copper (in combination with fibre to the node) to offer speeds of up to 80 Mbps.[9]

Does the UK, for example, have a properly competitive market in wholesale fibre connectivity? What benefits could such a market provide, and what actions could the Government take to ensure such a market?

31. [No comment]

What impact will enhanced broadband provision have on the media and creative industries in the UK, not least in light of the increased danger of online piracy? What is the role of the Government in assuring internet security, and how should intellectual property (IP) best be protected, taking into account the benefits of openness and security?

32. One way in which superfast has made a difference to media elsewhere is to enable a wave of video piracy. In Korea, one of the markets with highest penetration of superfast broadband, DVD sales fell by 62% between 2002 and 2008[10] compared to 86% *growth* in the US[11]. In 2008 85% of Koreans with high speed connections were believed to be illegally downloading movies.[12]

References

I discuss in detail the issues covered in this evidence in the following papers (as author or co-author):

Optimal investment in broadband: The trade-off between coverage and network capability	Apr 2010
Superfast - Is it really worth a subsidy? [academic paper for *info*, with Charles Kenny]	Feb 2011
Are you considering a fibre subsidy? Questions to ask [presentation to Australian MPs]	Mar 2011
Korea's Broadband: An overview and implications for Australia [research for Malcolm Turnbull MP]	Jun 2011
Does the Superfast Emperor have any clothes? A sceptical look at fibre subsidies	Sep 2011
Fact checking Stephen Conroy's NBN speech to the Press Club	Dec 2011

These are available at www.commcham.com/publications, except for the Korea paper, which is here.

---

[8] BT, *Openreach to transform broadband speeds*, 5 October 2011

[9] For ADSL, 'up to' speeds can often significantly overstate the achieved speeds, which in practice depend on how far you are from the exchange. However, because the copper loop lengths in FTTN are so much shorter, 'up to' speeds are likely to be much closer to achieved speeds. It is worth noting that FTTH often fails to achieve advertised speeds, because of constraints in the non-access parts of the network

[10] M. Kapko, "Warner Bros. To Release Films On Demand In South Korea Two Weeks Before DVD Release", *paidContent.org*, October 1 2008

[11] Digital Entertainment Group, "U.S. Home Entertainment Spending Tops $22 Billion For Sixth Straight Year" (Press release), January 8, 2009

[12] S. Hansell, "Internet Video in Korea Eclipses the DVD", *New York Times*, November 14 2008