

## **BSG foreword to Communications Chambers report**

### ***Domestic demand for bandwidth: an approach to forecasting requirements for 2013-2023***

At the start of 2013, the Broadband Stakeholder Group (BSG) announced its intention to focus upon and inform the demand side element of the overall broadband policy debate.

Following a lengthy and proper focus on the costs and capabilities of different technologies to support the delivery of government broadband speed and coverage targets, we believe the overall policy debate needs to pay as much attention to the demand side. Or in other words, to consider uptake and usage rates for broadband, what people use (and don't use) their broadband for, what they want out of their broadband connection and what the overall socio-economic benefits are of that usage.

We believe a better understanding of these issues is critical to determining whether UK broadband is on the right trajectory or not, including the relative emphasis given to factors such as coverage, take-up and speed. As the government commences its development of a new Digital Communications Infrastructure Strategy for 2015-2025, this demand question should be a central foundation for that analysis.

Accordingly, the BSG commissioned this report from Communications Chambers as an input to the demand-side debate. The scope of this report does not cover all demand-side issues but explains the methodology and results of a model Communications Chambers has developed that seeks to forecast UK domestic demand for broadband capacity for the period 2013-2023.

We were motivated to commission such a study for a number of reasons. Firstly, despite the global interest in whether broadband infrastructure is meeting demand and if it will stay ahead of that demand curve going forward there is arguably a lack of material on how one might model and measure that demand. Furthermore, we were interested in developing a technology-neutral approach to forecasting demand, rooted in the behaviours of consumers and the services they want to access over broadband.

Consequently, the approach Communications Chambers has developed:

- Is fully transparent about the methodology deployed and assumptions made
- Is anchored in the speeds required by different types of applications
- Accounts for likely changes in speed requirements over time and whether they increase or decrease
- Reflects the variations in demand across different household types in the UK
- Builds a quantified view regarding the probable and likely duration of different application stacks (i.e. when will people use applications simultaneously and for how long)

- Provides a picture of duration of peak demand in a household to consider how many households will need a certain amount of bandwidth for a certain amount of time
- Focuses on consumer use in the household – whilst applications typical to basic home-working are included, more specific business use cases are not covered

Taking this approach, Communications Chambers has combined the usage profiles of various applications into the usage of profiles of individuals and from this developed these individual profiles into household profiles. In all, 156 household profiles are modelled, based on their demographics (that is, the number of adults and children present); their intensity of use; and their TV type. These 156 household profiles are then combined into a picture of national demand, demonstrating the likely difference in demand across household types.

For example, in a single person household without HDTV, the model predicts that in 2023 the broadband connection is idle for most of the time with several hours per month requiring 5 Mbps and shorter periods within the range of 8-10 Mbps. In contrast, a high use, 4 adult household with a 4K TV sees appreciable usage almost constantly during the busy hours, with approximately 90 minutes of demand of 25 Mbps or more per month.

Looking across all households, the model indicates that the median household will require bandwidth of 19 Mbps by 2023, whilst the top 1% of high usage households will have demand of 35-39 Mbps.

At first glance these numbers might seem low compared with other speeds commonly cited regarding future capacity needs. However, we would highlight a number of factors the report raises which have a bearing on this:

- It is important to remember that 64% of UK households are one or two people and therefore there is a natural limit to the online activities of these majority households. For example, even if two people are each watching their own HDTV stream, each surfing the web and each having a video call all simultaneously then the total bandwidth for this use case is 15 Mbps in 2023.
- Another important consideration is compression. The bit rate for a given quality of video has fallen steadily over time and will continue to do so due to improvements in compression techniques. As such the model assumes an annual improvement in compression of 9% for SD, HD and 4K TV.
- Furthermore, we must be careful not to confuse traffic volume forecasts (which continue to predict rapid and continued growth) with what might be expected for bit rate. Video is a considerable driver of traffic and broadband usage but is relatively less important in bit rate terms. Existing access networks could potentially absorb greater amounts of traffic without upgrade. Hence an increase in traffic does not necessarily equal a correlated increase in maximum bit rate requirement.

We should also be explicit that Communications Chambers has, in its model and report, presented a middle case falling between an evolution of today's consumer expectations of the performance of applications and a perfect world where all applications would be instantaneous. The results are also

presented on a '4 minutes excluded monthly' basis. What this means is incorporating all required demands except for the 4 busiest minutes in the month.

Clearly this approach is ripe for interrogation and debate and as the report makes clear, reducing the excluded minutes pushes up the requirement. For example for a 4 adult, high usage household with a 4K TV, reducing the excluded minutes from 4 to zero would push the bit rate requirement in 2023 up from 38 Mbps to over 50 Mbps.

In that vein, the report also highlights a number of sensitivities to the model results which could change anticipated requirements. These factors include changing user expectations for factors such as download speeds and notably, reducing the time one would expect a software download, such as a console game, and upload of files to take. For example, in significantly reducing the base case assumption of 10 minutes waiting time to 2.5 minutes, then 16% of households require 83 Mbps. Reducing the waiting time further would quickly take demand over 100 Mbps for those households.

Accordingly what we are keen to emphasise in publishing the report, is that we are not presenting or endorsing an absolute "truth" on speed needs over the next decade. As with any report looking forward, one cannot predict the future with exact certainty.

Furthermore we should be clear about what is not within the scope of this study. It does not look at the ways in which one might seek to build demand for higher speed networks or services, nor assess potential innovation of applications over superfast and ultrafast networks.

However, what this report does do is set out a robust, clear and transparent explanation of its approach to forecasting demand. In line with the BSG's overall objective to put evidence-based information into the public domain to improve the quality of the public policy debate about broadband, we believe this report fills a significant evidence gap. As is often the case in developing a model to measure potential future behaviour, the value is as much in the rigorous analysis of the problem as in the output.

Ofcom's 2013 Infrastructure Report reports availability of superfast broadband services (defined as delivering a speed of at least 30 Mbps) to 73% of UK premises, 22% of fixed line internet subscribers adopting those superfast services and increasing 4G coverage in the UK. Looking at the impact of connection speed on data use, it also highlights the threshold at which data consumption plateaus at 10 Mbps, up from 8 Mbps in 2012.

In the context of these findings, the BSG believes that this report provides new insight and evidence to inform a variety of key broadband policy questions. In publishing the full underlying model alongside this report, the BSG wants to instigate an informed and evidence-led discussion about the future demand for bandwidth and what this means for UK broadband policy overall, including the issues of:

- Will anticipated demand be met by current and anticipated infrastructure provision from both the private and public sector?
- Will that infrastructure provision meet demand across all geographies, such as the final 10%, over time?

- What does this picture tell us about thresholds for basic broadband provision as the government seeks to build on its 2 Mbps commitment and support the provision of superfast services more broadly?
- What does this mean in the context of encouraging more people to take-up and use the broadband services available to them and the correct balance between this public policy objective and the drive for increased speed and capacity?
- How are consumer expectations likely to change in terms of what they want to use their broadband for, where they want to access connectivity and how will this impact on network provision?
- To what extent will network capacity respond to demand and to what extent might increased network capacity drive demand?
- What will the future picture of demand mean for policy making beyond the parameters of the Digital 2020 targets?

As the BSG works with industry and wider stakeholders on what factors the government needs to consider as it develops its longer-term digital strategy, this debate about the interrelation between network infrastructure and what people want and need to do over these networks becomes ever more important to define and understand.

This report brings significant new insights to this core policy question and the BSG looks forward to taking this debate forward.

For the report and associated materials, visit [www.broadbanduk.org/forecastingdomesticdemand](http://www.broadbanduk.org/forecastingdomesticdemand)