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The Knowledge Network

Clive Carter
Strategy & Market Developments
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29 November 2007

Dear Mr Carter,

Re: Future Broadband - Policy Approach to Next Generation Access

The Institution of Engineering and Technology (IET) is pleased to respond to Ofcom's Future Broadband - Policy approach to next generation access, consultation dated 26 September 2007.

The IET has in excess of 150,000 members worldwide drawn from a broad range of science and engineering disciplines. The membership represents a wide range of communications expertise, from technical experts to business leaders, encompassing a wealth of professional experience and knowledge, independent of commercial interests. This response has been prepared on behalf of the Institution's Trustees, after inviting input from its membership, and consulting with members of its Communications Sector Panel.

The Institution has responded, within its professional competence, to the questions raised in the consultation where it believes it can make worthwhile comment. We have also provided a synopsis view of our vision for the UK's Broadband future - Broadband 3.0, which we trust you will take into account in evaluating the IET response.

As requested a cover sheet for responses to an Ofcom consultation has been provided.

If you require further information or amplification of any aspect of this submission then please do not hesitate to contact me.

Yours sincerely,

Paul Davies
Head of Policy
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Question	Response
Question 1: When do you consider it would be timely and efficient for next generation access investment to take place in the UK?	The consultation background to the question strongly implies that optical fibre is the technology of choice for next generation access. It is our view that this is unjustified and that for economic, geographic and practical reasons future UK Broadband access will encompass a variety of technologies. Therefore the answer to the question is, in our view, that continuous investment, from today forward, is required to embrace a plurality of technologies solution in which newer technologies are progressively introduced.
Question 2: Do you agree with the principles outlined for regulating next generation access?	On balance the Institution agrees with Ofcom's outlined principles for regulating next generation access.
Question 3: How should Ofcom reflect risk in regulated access terms?	The consultation shows that Ofcom has given comprehensive consideration to the impact regulation can have on commercial investment, and the uncertainties which it faces in determining an optimised competitive investment in next generation access. In the circumstance where Ofcom will not have all the data necessary to mitigate risk in every circumstance it is important that Ofcom at least identify a clear and stable regulatory environment.
Question 4: Do you agree with the need for both passive and active access remedies to promote competition?	The Institution agrees with the need for both passive and active access solutions (as defined in the consultation) to give flexibility to competitive broadband access and service provision.
Question 5: Do you consider there to be a role of direct regulatory or public policy intervention to create artificial incentives for earlier investment in next generation access?	If regulatory 'artificial incentives' are adopted then a distorted market may result both transitionally and permanently. A market lead approach to investment in next generation access is preferred, whether for infrastructure or innovative services.

Broadband 3.0: The IET's view of the UK's Broadband Future

On both economic and technological grounds the UK will require a mixture of access technologies and delivery means for the foreseeable future. OECD data for 2006 shows that the UK had 19 broadband subscribers per 100 inhabitants, with 23% of these subscriptions being via cable services, and the balance of 77% being via DSL services. The UK access mixture in the future is likely to include not only twisted pair copper and coaxial cable, but increasingly terrestrial and satellite wireless, and for new developments optical fibre. No one technology can be assumed to be used from source to destination, but will be used in combination, and across a number of delivery services.

Innovative uses for already deployed infrastructures (particularly twisted pairs) are being used to take subscriber access data rates beyond the typical 20MBits/s of VDSL to more like the over-all delivery data rates of FTTC/FTTH e.g. Verizon's Double, Triple and Quadruple-play Ultimate Freedom services.

Current Broadband performance is not viewed as being adequate for planning the UK's future. What is required is a new Broadband concept, Broadband 3.0, which will: -

- Give confidence for private infra-structure and service investment
- Stimulate job creation
- Foster collaboration and inclusion
- Stimulate creativity both in the workplace and at home
- Be ubiquitous
- Be secure and very reliable
- Be fit for every type of commercial and personal financial transaction
- Meet Business needs connecting the supply and distribution chains
- Provide the secure reliable infra-structure for innovative preventative medical care services.

Broadband must continuously evolve to keep pace with future demands and opportunities. Consideration needs to be given to the fact that the performance of Broadband today, in the 'average' location, is what those (biggest users) with the very best data communication capabilities had five years ago. If this is projected forward by 2012 Broadband 3.0 will need to provide a norm in performance commensurate with what those who have the best data communications performance have today.

Increasingly services, both commercial and public sector, will be delivered digitally. A digital connection to every household, workplace and activity centre will increasingly be regarded as essential and become a high bandwidth data utility. It will increasingly be the means of efficiently conducting business administration and finance; a delivery means for entertainment - radio, television, games, music and movie download etc; a means for increased home-working; a means of delivering elements of preventative medical services; the means for secure personal and commercial

financial transactions; the means of gathering knowledge and information; and a tool in the challenges of climate change e.g. travel reduction.

Broadband 3.0 will: -

- be the UK's pipeline to competitive advantage, leaving the limitations of Broadband behind.
- be ubiquitous: it will be economically inclusive, socially inclusive and ideologically inclusive.
- encompass the whole data infrastructure including Next Generation Access (NGA).
- be technologically open, creating choices for the future, and necessitating technological innovation.
- be scalable – 10x access performance will not mean 10x the price.
- be a network of networks with mixed mode technologies. Through this means system integrity and reliability will be assured akin to the operating principals of mesh communication structures.
- be symmetrical with low latency and smart control of these parameters to fit application bit streams.
- be secure and very reliable.
- have Access that aggregates the needs of multiple, simultaneous applications.
- be predicated upon adopting internationally agreed standards so that both the infrastructure and the 'kit' price in the home reap the benefits of global markets

Asymmetric Broadband will remain the norm for some time due to the adaptation of legacy technologies, but ultimately, through continuous improvement, Broadband 3.0 will feature symmetry. Symmetry is a key advantage of both passive fibre solutions, and software defined wireless solutions.

Downstream bit rate is not necessarily the optimum measure of Broadband access quality – especially for applications needing symmetrical bandwidth and low latency.

Increasingly data access will be expected to be anytime, anywhere. This view is promoted on the evidence of the public's appetite for WiFi and the potential use of WiMAX or HSPA. This predicates that there will be an increasing use of wireless to deliver services (downstream and upstream) both short range (10s m), and for the 'last-mile' if internationally agreed suitable spectrum frequencies become available, and safe power levels determined.

The investment in NGA will in the main be private/commercial money and there should be no regulatory obstacles to such investment taking place now. In practice this investment will require regulatory certainty and this should be provided with minimum delay, so that the UK broadband infrastructure can progress towards Broadband 3.0 in line with the UK retaining a strong position as a knowledge economy.

The access technical solutions for other countries do not necessarily apply to the UK scenario, when taking into account geography, attitudes to funding infrastructure investments, subscriber population densities and dispersion, and the operator and service competitive environment.

Tying all the above together, and leading to Broadband 3.0, the UK requires a National Broadband Plan which sets out what ‘fast’ access technology can be progressively expected/afforded in which geographical location, and what will be the typical download and upload access speed that it will offer.

The delivery technology(s) will need to be identified on the basis of the terrain geography, the existing telecommunications infrastructure (backhaul), and target customer population density.

The National Broadband Plan will need to identify which known, and potential, competitive suppliers for each candidate technology may be anticipated to have an interest in infrastructure and or service provision.

For cost of technology reasons it is unlikely that, in the short term, all users will get a uniform high performance broadband service, for the same price. It is unlikely that Government would wish to use public funds to make this possible, but will rely upon competition and the market to drive this through in the longer term. It will be down to private funding to make the investment in a regulated sector where return on investment will take place only over terms greater than the banking sector’s usual requirement of two to three years!

It is recognised that the Broadband 3.0 National Broadband Plan will not result in a common high bandwidth broadband service to all customers at day one. Broadband 3.0 is scalable, technology neutral and will, improve on the current situation of universal UK digital services access which often is only dial-up modem based, or only of equivalent speed (due to contention and infrastructure serviceability issues). A degree of ‘digital divide’ (urban: rural) may be an inevitable consequence in the short term due to technology and economic factors.

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