

The Next Phase of Broadband UK: Action now for long term competitiveness

Review of Barriers to Investment
in Next Generation Access

Final Report

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Introduction

“People tend to overestimate what can be done in one year and underestimate what can be done in ten years”, J. Licklider, Libraries of the Future, MIT Press 1965.

The focus of this review is the development of Next Generation Access (NGA) in the UK. For industry participants – telecom operators, broadcasters, technology vendors, media companies – this is very much a live issue. These players are very interested in, and knowledgeable about, NGA and have proved eager to contribute to this review. Their future depends, increasingly, on the role they will play in the development of this new infrastructure and on the rules that will govern their access to it.

For the Government, too, the prospective gains and value of NGA, in economic terms and in delivery of public services, make it a vital subject.

NGA is, however, a dry subject for most. For the general public the technical and regulatory issues surrounding the development of faster broadband are of marginal interest at best. Network architecture, interconnect protocols and equivalence of input are all vital for industry players and regulators, but hold no significance for the vast majority of end users, and nor should they. The effect of all these things, however, in terms of the services that are eventually paid for and delivered, is of great relevance to the average household.

The last ten years provide good evidence of how deeply the telecom and broadcasting markets have changed in the UK, and how processes like this review have contributed to the development of dynamic retail markets and rapid take-up of services that are now part of our daily life.

In 1998:

- mobile telephony penetration was at 16%; voice and text messaging were the only available services;
- the debate about digital television was only just starting; terrestrial television was offering five channels; satellite television penetration was 10%, with cable penetration smaller again; and
- penetration of dial up internet in the UK was 9%, below the European average.

In 2008:

- broadband has become the standard for internet access; competition between providers has delivered increasing speed at declining prices; penetration is among the highest in Europe with 58% of households, or some 80% of those households with a PC subscribing to broadband;
- digital television has reached coverage of more than 87% of the population and is well on its way to universal availability; consumers have a choice of more than 80 terrestrial channels; and
- mobile telephony has almost universal penetration, with 86% of all adults owning at least one mobile telephone and a growing number of consumers using mobile devices to access internet based services.

The evolution of technology, business, and society have undoubtedly contributed to this transformation. But, so too, have the regulatory and policy initiatives that have enabled competition, investments and innovation. Commitment to competition has led to investment and innovation, driving the progress of the UK market. Landmark initiatives include:

- the award of new radio spectrum;
- the Communications Act and the creation of Ofcom;
- the definition of the switch-over plan for digital television; and
- the Strategic Review of Telecoms in 2005 and the functional separation of BT's access network.

These steps forward, not always of obvious relevance for the general public, have led to a dynamic retail market that is now offering choice and innovation to consumers across several technological platforms. The next ten years can bring a similar and even more exciting transformation.

The development of NGA is not just an upgrade of a digital infrastructure that makes a user's web browsing speedier, although this on its own will be welcome to many. NGA arrives at a time when basic popular services, such as voice telephony, radio and television broadcasting are extending their reach from existing fixed and wireless networks to the Internet. At the same time, the continued development of new digital devices is making it possible for consumers to use a growing range of web based services without any interaction with a PC.

In this next phase of online life, access to the internet will extend beyond existing PC 'literate' users: it will be embedded in new, broadband enabled versions of familiar devices. These devices – such as radio, TV sets and mobile handsets – will be user-friendly and central to everyday life of most households. Their functionality is also likely to evolve to support the delivery of a broader set of services.

This will not happen everywhere at once, and will not be the norm this year or next. One of the key findings of this review is that it is a mistake to believe the UK must have an NGA infrastructure tomorrow or suffer as a result. We should not overestimate what technology will deliver in one year.

But we cannot afford to underestimate its impact over the next ten years. Over that time:

- broadband will become an essential digital utility for the country; and
- an extensive upgrade of the access infrastructure will be necessary

Now is the time to set the scene for this transformation and give the country the best opportunity to capitalise.

Because of all this, this review should be of relevance to the public and will hopefully be part of the process that will enable a transformation in the UK's communications infrastructure.

Executive Summary

Context and key issues

Broadband has become an essential platform for communication and access to information, knowledge and services across the world. Penetration of broadband has grown rapidly in the UK and the country today has one of the highest penetration rates in the world. The physical infrastructure that delivers broadband in the UK is a combination of existing copper and cable TV networks.

In recent years NGA networks based on fibre have begun to be deployed in other countries. In some cases, namely Korea, Japan and Singapore, new access networks have grown to represent the standard platform for internet use. In the UK, fibre access is still limited to large to mid-sized businesses, with hardly any deployment of fibre for connecting homes.

The debate on NGA has recently stepped up driven by the launch of new services (primarily video) and the continued growth in traffic over the internet.

It is against this background that, in February of this year, the UK Government decided to launch an independent review. The terms of reference of the review are reported in Annex A. These specific issues have helped shape the activity of the review and are discussed in the main report.

In presenting the review's conclusions and recommendations, however, it is useful to group them around the critical themes that have emerged in the review team's work, and the continued and constructive dialogue the team has had with government departments, Ofcom and other key stakeholders.

These themes can be summarised in three main questions:

- 1) Is the delay in the development of NGA translating to a competitive disadvantage for UK businesses and UK citizens?*
- 2) Will the market deliver an investment in NGA on its own, or should the Government intervene now through subsidies or a structural change in regulation to get the roll-out of NGA started?*
- 3) Is there a role for the Government to play in the development of NGA infrastructure and, if so, what type of initiatives ought it to pursue?*

Approach and methodology

The future of broadband – its economics, its technological development and its impact on telecommunications, media, business and society at large – is a vast, very complex and widely researched topic. A large number of task forces, projects, forums and think-tanks are at present investigating these issues. Within government itself, other initiatives in this area are currently being undertaken.

It is against this background that it was decided early in the project not to embark on new primary research on the economics of, or demand curves for, NGA but rather to draw on existing data and facts, and spend most of the available time in engaging with the relevant constituencies to get their views on the main issues, uncertainties and opportunities. We have particularly interacted with Ofcom, the Broadband Stakeholder Group, the main service providers and major broadcasters. We have also received valuable input from a wide range of constituencies, from technology vendors to bodies representing end-users. A list of organisations consulted is contained in Annex B.

Our objectives in doing so were: to develop a shared, fact-based view of the competitive situation of broadband infrastructure in the UK and the available options for its developments; to remove prejudices and myths about fibre deployment and its impact; and to identify a pragmatic way forward to develop a competitive up-to-date infrastructure.

This process has helped us cover a wide range of issues in a relatively short period of time. We hope it has played some part in moving the debate forward over the last few months. It has certainly given us strong evidence of key stakeholders' readiness and desire to engage in a constructive process to equip the country with a competitive NGA infrastructure.

We have benefited enormously from the constructive response that we have received from our interlocutors, and are grateful to them all.

Summary of conclusions

Joseph Licklider, one of the founding fathers of computer-based communications, said in 1965 that there is often a risk of overestimating the impact of innovation in the short term, and underestimating it in the long term. This could, in the extreme, be the conclusion of our review. There is no need for immediate major government intervention in the short term to accommodate traffic growth, but in the next five to ten years NGA will become a critical infrastructure and, as such, the Government should actively support and monitor its development.

IN THE SHORT TERM, THE CASE FOR A MAJOR GOVERNMENT INTERVENTION IS WEAK ...

The high costs of NGA, and high expectations of what it can deliver, tend to raise expectations in some quarters that the Government should make a major intervention – such as a large subsidy or structural change to regulation – to support the market. However, it is the conclusion of this review that the case for such a major intervention is weak at best. There are three principal reasons for this.

First, broadband penetration is now at about 60% (placing the UK at 5th in the OECD); coverage of DSL has reached 99.6%; average headline speed has gone from 3.6Mb to 5.9Mb; strong competition has delivered value and choice. This has, in turn, led to the creation of one of the most developed internet economies in the world: online advertising has now reached 18.9% of total advertising spend; online retail is the largest in Europe accounting for 15% of total retail. Review of other countries indicates that drivers for their investment in NGA thus far differ widely and are not necessarily comparable with the UK. Also, there is little evidence that higher penetration of fibre has led to a material changes in uses.

Second, there are strong indications the market is delivering investment in NGA. Virgin Media continues the deployment of high speed services on its network and is on course to make up to 50 Mb/s available to around 12.5 million homes by 2009. BT has announced its intention invest £1.5 billion in an NGA deployment covering 10 million homes. Other service providers are evaluating ways to upgrade their access networks from DSL to fibre. Additionally local initiatives, including some innovative investment models, are gaining momentum in various regions and cities.

Third, although demand for bandwidth and internet traffic continues to exhibit strong growth, there is little evidence that, in the short term, UK consumers will experience a detriment due to the lack of an extensive NGA network. Some consumers, particularly at peak times, experience a reduced level of service, suggesting stress on the network, but this is more likely evidence of a bottleneck in the backhaul, rather than access.

... BUT GOVERNMENT SHOULD ACT NOW TO SUPPORT INVESTMENT IN NGA

This first conclusion, however, should not lead to complacency. In the mid- to long term, Broadband/NGA will become a critical digital utility, essential to the competitiveness of any country and to the quality of life of its citizens. The UK will be no exception and, if anything, it will be even more dependent on this infrastructure than other economies. Here, high-quality broadband will be essential for the continued development of sectors that in recent years have elevated the UK to a position of global leadership, such as the creative industries,

financial services, software and gaming. Equally importantly, broadband will be central to critical processes of information and innovation in education and health services.

Because of this, the Government and Ofcom, as the two principal entities involved in determining the efficient and effective deployment of NGA, need to play an active leadership role in shaping broadband policies.

This does not translate into subsidies or structural changes in regulation, but rather a set of initiatives that could support and inform the activity of regulators and industry players in their journey to NGA. The government should seek to remove obstacles that could potentially delay or compromise the development of the new network.

Recommendations

We have identified four areas where the government should consider specific initiatives to support and facilitate the deployment of NGA.

1) Set out a framework for delivery of NGA

The development of NGA is a challenging task for the whole industry and will build on the involvement of a large number of stakeholders. Building on the progress in the last six months, it is now a good time for the government to set out in some detail a framework for the delivery of NGA. Such a framework would provide an up-to-date reference point for all relevant parties and help them in the implementation work that is about to begin. Whilst it will be for the Government and Ofcom to finalise the specifics, it is this report's recommendation that the framework should recognise, among other points, that:

- NGA, defined as fast high-quality access, will be delivered through a combination of digital technologies which will coexist in different parts of the country: fibre (to the home or to the cabinet), cable, wireless and copper.
- Adoption of open network models and access to ducts and fibre of new and existing networks can create a competitive wholesale market and encourage investment in new services.
- NGA will most probably result from a combination of national and local networks. Local developments are welcome and are to be encouraged provided they comply to access standards of interoperability and open access

2) Launch specific initiatives that do not distort the market, but provide some further momentum to the deployment of NGA

This report has identified ten initiatives that should be explored further to facilitate the progress of the UK towards NGA. They are grouped in three clusters based on their expected primary impact on the industry: create the stimulus for the upgrade of access infrastructure; facilitate the implementation of NGA by removing uncertainties and lowering the cost of build out; and create the conditions to favour the development of new investment models.

Create stimulus for the upgrade of access infrastructure. This would include:

- **Accelerating the release of radio spectrum to favour the development of new wireless broadband services.** Ofcom already has a programme of spectrum release, refarming and liberalisation, and there are two bands suitable for wireless internet services which should be made available in the near future – more than 300MHz of suitable spectrum is planned for release. However, the auction of these bands is being delayed by litigation with current licence holders and reform of EU directives. Ofcom should seek a route to release available spectrum to the market as quickly as possible, while the Government should support this effort, including by seeking early resolution of deliberations in Europe over the GSM directive.
- **Mandating transparency on traffic management policies for network capacity.** Ofcom should require internet service providers should tell their customers how they manage traffic on their network. This would make consumers aware of the ‘true’ bandwidth they were receiving, and could lead to differentiation of services in which consumers value bandwidth and are willing to pay for them. This might then create stimulus for further investment in network upgrade.
- **Supporting the introduction of an agreed specification for newly built homes.** The Government has a target of up to 240,000 new homes to be built per year up to 2020. It would be a missed opportunity not to equip them with NGA. The government should drive forward an agreed specification generated by the construction and communications sector to raise awareness of NGA in the minds of the construction industry and help NGA connectivity begin to emerge as a valuation criterion for homes.

Facilitate the implementation of NGA by removing uncertainties and lowering the cost of build out. Government and Ofcom should, in their respective roles, remove uncertainties and facilitate deployment of NGA.

- **Regulation – Ofcom to identify a specific implementation path.** As Ofcom’s consultation on NGA, launched in 2007, comes to a close, a number of issues have emerged that need resolution. These range from the interconnect regime in IP networks, to the date of switch-over from copper to NGA, to the nature of passive remedies and wholesale products, to the future of the USO and requirements to provide 999 access. In the next phase of work, Ofcom, as it did in the case of the Telecoms Strategic Review, needs to take a leadership role and drive the industry towards timely resolution of these issues. This will be a difficult task, but one that is essential to defining an actionable implementation plan.

This is likely to require significant time and effort and, at least for a period, an even more intensive interaction with industry players either to encourage bilateral agreement or lead multi-party negotiations. But at this juncture, this task will prove essential and the Government should strongly back Ofcom in carrying it out.

- **Lowering build out costs.** Civil works account for up to 80% of the investment in NGA. The potential savings if the cost of those works can be reduced are material. According to the Broadband Stakeholder Group, a roll-out of Fibre-to-the-Home to 80% of the population could cost up to £16 billion, of which more than £12 billion will be the civil engineering cost – in other words saving only 10% of the civils cost could mean £1 billion. The Government should undertake two initiatives to achieve that reduction.

One is pursuing better coordination of streetworks to share the cost of road openings between utilities. There are some 1.2 million streetworks per year. The Government has made some progress in better coordinating them through a combination of legislation and joint working with the utilities. There is though scope to do a lot more and reduce costs for all. The Government should use the existing regulatory framework to ensure coordination of works is the norm, but be prepared to take further steps if results are not forthcoming.

The other initiative to reduce rollout costs is by relaxing constraints on overhead deployment of fibre cables. Unlike other countries, operators deploying fibre in the UK are required to bury the lines except where they already own poles. Figures supplied by Cisco suggest the cost for rollout in eight major English cities could be reduced from £1,200 to £400 per home passed.

The Government should therefore amend the planning laws so that overhead deployment can take place where necessary, subject to local consultation and certain constraints in sensitive areas. For rural areas in particular, overhead deployment can make the case for investment much stronger. While there will be issues around the environmental impact of such installations, those in the countryside who want better broadband provision will need to balance the impact of new poles against the benefits of improved services.

Additionally, Ofcom should move ahead with work to address barriers to alternative ducting methods such as the use of sewers.

- **Providing updated and detailed guidance on the approach to applying business rates to fibre.** Uncertainty over the liability faced by owners and occupiers of fibre networks could add a further brake on investment. The Valuation Office Agency should provide updated guidance in the light of both recent litigation and the anticipated growth in NGA networks.

Create the conditions to favour the development of new investment models. The construction of a new access network creates the opportunity to adopt new business and investment models and, in particular, local open access networks. There are more than 300 such schemes across Europe, and Sweden, with a quarter of its broadband provided by fibre, has 200. Some of these are funded by householders providing a high up-front installation fee, sometimes funded from additional borrowing on their mortgage, recognising the potential impact of the new infrastructure on the value of the home.

Such networks warrant attention since they can play an important part in the overall broadband picture, and there are several examples in the UK. Such developments might though be threatened by fragmentation if their technical standards are different and they therefore present a barrier to service providers to utilise their infrastructure. There are two relevant recommendations.

- **Establishing standards for local NGA developments.** In order to maximise the opportunities for scale deployment, local access networks across the country can organise to standardise technical requirements and present a coherent front to service providers. The Government should ask the Community Broadband Network to organise such a development.
- **Directing Government support towards open access networks.** Where local or regional authorities are investing in broadband, the Government should amend its guidance so that central government support is conditional on the scheme complying with the open access standard. Where they are privately funded, Ofcom should consider the introduction of a 'must carry, must connect' rule, whereby local access networks cannot unreasonably refuse to carry a service provider, and service providers cannot reasonably refuse to make their service available through the local network, provided this complies with the open access standard.

3) Establish a structured, permanent benchmarking process to monitor the development of NGA in the UK and in relation to other Countries

The initiatives outlined above will further encourage investment in NGA. Their implementation will not be quick or easy, and there are still risks of delay and market failure. To ensure momentum is maintained, the Government should signal their leadership by naming a senior figure to monitor delivery, and Ofcom should consider a parallel process. The Government should additionally establish an ongoing process for identifying barriers to deployment and rapidly addressing them.

It should further institute an annual NGA event to draw together detailed international benchmarking by Ofcom, industry insight and analysis from the Broadband Stakeholder Group, and wider views to form an overall assessment of progress in the UK. This process would help provide a continued stimulus to all stakeholders by reviewing progress against plans on all key aspects of NGA development: regulation, demand, and network roll-out. It would also allow the Government to build a robust fact base to determine if further action is needed to expedite the upgrade of the broadband infrastructure. This would represent the necessary input to the fourth recommendation.

4) Invest time and resources to identify remedies to adopt in case the market fails to deliver the required NGA investments

The Government ought to be working, along with Ofcom, to identify the remedies that would be needed in the unlikely event of market failure and prolonged delay in the development of NGA. This report does not highlight any specific initiative but only the broad circumstances in which, some time from now, the government ought to consider their adoption.

Structure of the document

This document is structured in four parts:

- **Part 1** where the report reviews in summary some key facts about NGA and highlights the challenges and opportunities that characterise its deployment.
- **Part 2** where, based on evidence on the UK market, comparisons with the international situation and short-term expected evolution, the report concludes that *the case for public intervention now is weak at best*.
- **Part 3** where, due to the growing importance of broadband to society and the challenges still associated to its deployment, the report recommends that the *Government should, with Ofcom, take a leadership role on the deployment of NGA*.
- **Part 4**, in which the report formulates specific recommendations for short, mid and long term initiatives that the government could undertake to *remove obstacles and facilitate the development of a competitive NGA infrastructure* in the UK.

Further facts, data and supporting materials are provided in the annexes.

The UK has a unique opportunity to develop NGA infrastructure in an innovative and effective way:

- by taking full advantage of the flexibility that new technology and business models offer;
- whilst preserving the commitment to competition and an independent regulator that has delivered, thus far, one of the most competitive and vibrant broadband, telecom and media environments in the world.

This review is intended to contribute to such development.