# CBI submission to Ofcom Consultation on Next Generation Access

## December 2008

## *1. Introduction*

1. The CBI appreciates the opportunity to comment on Ofcom's thoughtful and important consultation on Next Generation Access Networks (NGAs). As Ofcom recognizes, NGAs could provide a significant platform for the development of innovative and widespread services for businesses and consumers, and a major boost to ongoing economic growth, competitiveness and value-adding. This will be particularly important given the current economic downturn. But inappropriate, inadequate or misjudged regulations and policy frameworks could weaken competition and investment and lead to ossification of existing or the emergence of new supply-side bottlenecks.

2. We support Ofcom's overall objective "to promote private sector led investment in the right technology at the right time, based on a competitive environment and supported by the right regulatory framework." We also support Ofcom's principles developed in the Strategic Telecoms Review being applied in general to the development of NGA.

3. However, having said this, we also believe that Ofcom needs to more explicitly address certain important issues that are currently overlooked or only obliquely discussed is NGA development in the UK is to significantly boost economic competitiveness and the innovative and value-adding capabilities of a broad range of UK businesses. Through a step change increase in bandwidth access at a local level, NGAs provide the basis for both a qualitatively new competitive communications environment for new services and applications development. As Ofcom's consultation documents seems to recognize, the key regulatory task is how to clearly indicate to as broad a range of investors as possible how regulation will facilitate the emergence of competitive new market opportunities in a timely manner.

4. To provide this clarity of perspective, we believe the issues Ofcom needs to consider in more detail and that we provide initial comment on are:

- the nature and drivers of consumer and business demand for NGA ***in relation to the transition from the current credit crisis to the medium term economic environment of an "Internet of things" (particularly within the context of a "liberal interventionist" strategy as called for by Stephen Carter at Ofcom's recent International Communications conference)***;

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- the nature and regulatory treatment of possible investment partnering and risk sharing between operators, and between operators and business users, ***with in an all-IP NGA environment***.

## *2. The nature and drivers of demand for NGA*

5. The debate on NGA has been dominated by two concerns. On the one hand, investment is viewed as necessary given the expected strategic contribution of NGA to economic growth, service innovation and competitive advantage at a time when other leading economic powers are making major advances in the field. On the other hand, concerns exist over whether sufficient demand exists to provide adequate returns on investment for network providers, given the sizable investments required, the uncertain nature of demand and regulatory requirements for competition.

6. As most operators are at the earliest stages of NGA investment, the issue has been posed as a chicken-and-egg situation whereby investment will be remain limited until significant demand occurs, and demand will be restricted while network capacity and services are unavailable. The current credit crunch and economic downturn will exacerbate this situation in the immediate term, and possibly longer if adequate market-based incentives do not emerge. In this context, the CBI believes that a simple evidence or principles-based approach will be inadequate, as they are unable to provide sufficient clarity as to what emerging markets investors can actually expect to invest in.

7. We agree with Ofcom that evidence of the specific services requiring significantly higher than current bandwidth for which there is significant demand is at present unavailable. But this does not mean that the drivers of demand, and their interaction with existing fundamental, long term technological trends in relation to NGA, cannot be usefully considered in much greater detail than Ofcom's consultation document does at the moment. We believe that deeper analysis of two inter-related issues would usefully add to the debate. First, analysis of the likely business and consumer demand-side characteristics and conditions for NGA service development possibilities in the short and medium term. Second, analysis of how investment in NGA networks and services for such demand-side potentialities can be developed and regulated in order to incentivise entry of as wide a wide range of investors as possible. The rest of this section explores the first of these two issues whilst the next section explores the second.

### Current consumer demand

8. Ofcom defines NGA as provision of access to the home or (curbside) cabinet, usually at speeds above approximately 20Mbps. With NGA conceived thus primarily in relation to households, demand for NGA services is subsequently largely framed in terms of consumer demand (e.g. video-on-demand entertainment services) in the UK.1 The CBI believes this perspective is too restrictive. While Ofcom's definition is not overtly technologically biased, and takes a more

[1] The Broadband Stakeholder Group (BSG) also largely focuses analysis on consumer demand. Though some exception is usually made for SOHOs (small offices in homes), it is usually assumed that businesses can get bandwidth when and where they want it - for example, the Caio report for the government on barriers to NGA investment in the UK.

varied definition and nuanced view than some, its focus nevertheless skews away from discussing more variable services and their development that will arise in combinations of fixed-line/wireless and fixed/mobile wireless technologies. These technologies will almost certainly play a major role in bringing high speed applications and services to rural areas and may also be a significant means of delivery in urban areas, and in pan-regional on-the-move services.

9. Such variable network topologies and technological mixes is often particularly important for e-commerce (as distinct from linear entertainment) services. NGA deployment will enable a raft of applications and services of variable nature and bandwidth, from flexible working to tele-medicine, which rely on consistent levels of quality of service provision and more complex relationships between consumers and service providers than more linear entertainment services. This aspect of consumer demand, and of e-commerce services in particular, is largely overlooked. Yet it is questionable that, in current conditions of economic recession, consumer demand for entertainment services will increase much above current levels or prices such as to drive significant new investments. While growth of consumer demand for e-commerce services will inevitably rise and fall at times, investment in e-commerce services by contrast can be expected to grow as transaction costs are reduced through, as discussed below, business demands for productivity gains and substitution and new service possibilities subsequently emerge.

10. As the French EU Presidency has suggested in relation to the i2010 strategy, a future global leadership position in applications and services will need to exploit new wireless technologies to a significant degree. More precisely, and as underlies Ofcom's spectrum strategy, dynamic service growth will depend upon combinations of different technologies that respond to differing geographic and economic demand. Stephen Carter has also recently spoken of the need for a "liberal interventionist" strategy for communications. It would therefore seem helpful for investment planning purposes if Ofcom's NGA analysis was articulated more comprehensively to elaborating the variable network topologies and technological combinations of such a strategy than its current focus on FTTH or FTTC allows.[2]

## Business demand – ongoing search for productivity gains and for value-adding

11. In 2003, a CBI report on business use and demand for broadband found that, even though businesses could get leased line (including fibre-optic) provision for high data transfers, they saw value in development of public broadband provision.3 This was because, while leased lines could provide high capacity data transfers with particular groups of suppliers or distributors, broadband offered lower per unit prices. For example, low cost broadband offers the potential to connect with digital markets, not just regional or corporate centres, or select groups of suppliers and distributors. In addition, because it lowered average production costs through replacement of differing legacy systems with common, often off-the-shelf technologies,

[2] Ofcom's discussion of sub-loop unbundling, LLU and backhaul address this issue implicitly but, as discussed in section 3, too obliquely.

[3] "Broadband for Business - The Value Proposition in Manufacturing & Retail", October 2003.

broadband provided a mass basis for engagement with customers (and thus economies of scale) in ways that leased lines could never do. So businesses have an incentive to develop advanced broadband applications and services.

12. The CBI/Google 2006 survey of business and consumer use of the Internet, and the CBI's 2008 survey of how IT services contribute to UK business competitiveness and value-adding published earlier this year, took this analysis further,[4] indicating how consumer centricity was becoming the focus of companies' service development. Nevertheless, though, the 2008 survey also revealed that, while a competitive communications market was considered a major regulatory plus, demand for NGA was currently quite low amongst many companies – the highest at around 25% being amongst medium sized ones. Similarly, a recent Communications Management Association (CMA) study found that only around 30% of respondents would be prepared to pay higher prices for bandwidth up to 100Mbps – and this combined internal and external uses. As a result, the CBI strongly supports Ofcom's and the Caio report's preference for market-led development of NGA, and avoidance of public sector intervention.

13. Having said this, as already suggested, Ofcom could go further than a rather cursory articulation of business demand (pp. 21-22) to identify the measures that could facilitate the strong propensity for growth of these markets. The current economic downturn will undoubtedly reduce overall business demand for higher priced NGA services even further unless applications and services other than traditional consumer entertainment and e-commerce ones can be provided through NGA. ICT demand in general has become increasingly cyclical and more tied to growth in overall GDP. Applications and services are the exception at the moment, and will possibly be so in the future, depending on the regulatory and policy environment. But the CBI believes Ofcom should seek ways to encourage such demand if as broad a range of NGA investors and services as possible is to be developed.

14. In particular, the focus on household demand fails to address the potential and structure of future demand for service development in an "Internet of things" - and the broad range of business interests (and potential investors) in such an agenda. As discussed below, this will almost certainly have significant potential impact on business and consumer demand for on-the-move NGA service development, and regulatory implications encompassing local access more widely than proximity to the home.

## Medium term demand drivers – "the Internet of things"

15. Huge demand for communications bandwidth, networking and services will potentially be driven by the development of the Internet of things.[5] Intelligent networking of embedded devices and remote sensors in everything from roads and cars, to packaging and white goods, to retail items and POS systems suggests demand for local bandwidth availability well in excess of the access provided by today's copper-wire networks. But for the ubiquitous inter-connection of static and on-the-move devices and sensors amongst households, business supply chains and retail outlets,

[4] See "A CBI/Google Survey Of Internet Trends For Business And Consumers", Nov. 2006; and "UK Competitiveness: the role of IT services", July 2008.

[5] A point we made in our submission to Ofcom's Strategic Telecoms Review, Part 1 (see paras. 14 and 15).

as well as public utility infrastructures, bandwidth access will need to be much more dispersed, variable and scalable than in a PSTN environment.

16. The French Presidency's i2010 September 2008 conference highlighted the fundamental importance of the Internet of things to future demand in an NGA environment. Ofcom, however, overlooks how this issue will link into and potentially drive and structure NGA network and service demand and development. The issue may be more pressing than might be assumed. The technical community has been pointing out for quite a while now that the number of IPv4 domain names and numbers is fast running out.[6] Even if the technical community's calculations are too restrictive, ownership of domain address blocks by registries and registrars within the context of sharply declining overall IPv4 availability could have a significant impact on demand, availability and pricing of NGA services without a clear overall transition path to IPv6.

17. Though of course Ofcom does not regulate domain names in the UK, within this scenario government may act to support a broad-based transition if a properly competitive environment is to be maintained. Ofcom would need to consider carefully the competitive implications of such government action for ex ante policy regulation of NGA deployment, especially in regard to the position of SMP operators, and joint ventures and risk sharing between NGA providers in any particular geographical area. This will be particularly important to ensure that any "liberal interventionist" within the emerging communications markets strategy supports competition.

## *3. Policies and regulation for incentivising broad investor entry*

18. Estimates of the cost of NGA deployment vary according to the technology used (e.g. FTTC or FTTP) and the penetration rates assumed. The recently published Broadband Stakeholder Group report into costs of NGA in the UK, for example, estimates the cost of delivering an FTTC solution in the UK at approximately £5 billion whereas a full FTTH solution would be nearly £30 billion.[7] These figures only assume about 31% take-up across the UK. Higher take up rates would reduce the cost per home but increase the overall costs. The exact magnitude of financial requirements will depend on how the competitive strategy of operators determines whether they invest on a local, national, regional or international scale, as well as whether they invest in next generation local-loop or backbone networks or a combination of these. Within this context, the nature of risk sharing will be largely determined by the architecture of IP networks and service development, and by the overall regulatory structure.

19. In this regard, we agree with Ofcom that in areas where FTTC or FTTH has occurred, it will be very hard for any potential competitor to make a similar investment, creating de facto geographical network monopolies in the short if not medium term. It was because of such considerations that we proposed, in our submission to Ofcom's 2007 NGA consultation, that it might be "of value to allow for incremental, geographically diverse competition and multi-

[6] Within two years, according to a presentation at the OECD Ministerial meeting on the Future of the Internet Economy in Seoul, June 2008, by Geoff Huston, Chief Scientist, APNET. Similar time periods were given by various representatives at the recent (3-6 December) Internet Governance Forum in Hyderabad, India.

[7] "The costs of deploying fibre-based next-generation broadband infrastructure", September 2008.

investor models to occur in the near to medium term through some degree of geographically differentiated application of ... regulatory principles." We further argued, however, that "it would be necessary within such a situation to provide guidance as to the level and nature of competition it believes is needed to sustain emerging NGA markets – and to establish time-specific benchmarks that would lead it to either impose, or forbear from imposing, ex ante regulation." Finally, we noted that this "does raise the issue of vertical integration. To avoid challenges on such grounds, Ofcom would quite possibly need to proactively engage with the Office of Fair Trading, as Ofcom's remit gives it the right to do."

20. In this year's consultation document, Ofcom chose not to address these issues, but we would urge it to do so. In this section we will argue, firstly that the development of all-IP networks (particularly within the context of the Internet of things) makes this more desirable and easier; and, secondly, that the principles raised within Ofcom's consultation document can, with some further articulation, support such models to increase potential investor engagement and competitive pressures for NGA deployment. This will be particularly valuable in ensuring that any "liberal interventionist" strategy remains pro-competitive within an all-IP environment.

## IP traffic handling, revenue-generation and sharing

21. As Ofcom knows, NGAs will largely be based on Internet protocol technologies whose implementation in network architectures will fundamentally differ from the traditional trunk and branch structure of telecoms networks originally designed for analogue transmission. Simply put, control over the traffic that passes over a traditional network can be exercised at the switches where branches meet the trunk (the main backbone network). But the current structure of the IPv4-based Internet is intentionally decentralized, with data packets determining the ultimate address and routers rather than switches simply sending traffic on to the next router in the network or networks which is freest on a first-in-first-out basis (and sometimes dropping them if buffers overflow). The fact that control lies less in the network – as with traditional copper-based PSTNs – and more under the determination of users or the applications or services they are using has implications for technological and service development that Ofcom's consultation paper overlooks.

22. In developing IP-based networks, whether at a local or trunk level, the CBI believes it is in the UK business community's and economy's best interests that operators develop traffic management regimes that facilitate this service innovation while enabling them to provide end-to-end quality of service control. Peer-to-peer communication of video-intensive, multiple formatted and interactive applications can suddenly and unpredictably demand huge bandwidth. This makes meeting increasing business demands for guaranteed end-to-end quality of service (needed to provide customers with high-value services wherever and whenever they want them) vital. IPv6, which vendors and operators are continuing to develop within the Internet Engineering Task Force (IETF), will provide such inter-operability, network integrity and security.

23. Within an all-IP environment - i.e., where operators have both an IP-based NGA and NGN backbone –close (or at least highly trusted) inter-connection agreements between operators are needed if network efficiencies and market aggregation and revenues are to be maximized. As a result, risk and revenue sharing arrangements between partners become vital adhesives in

assuring performance of the overall system. This trend is part of a wider one whereby, as operators move up the value chain from simple network provision to service providers, they and large business users increasingly become both competitors and co-operators at one and the same time. As bitstream interconnection becomes the norm, is leading to a growing lessening in the differences between the nature of wholesale pricing structures between network operators and individual discount pricing between operators and large business users, with both being increasingly based on quality of traffic handling quality and quantity for all parties.

24. The question for this consultation in regard to these trends is: what kind of risk and revenue-sharing arrangements are possible and optimal in terms of the need for investment and competition between partners at the level of the NGA, according to the overarching principles of regulation enunciated by Ofcom?

## Vertical vis-à-vis horizontal risk sharing

25. The CBI's 2007 NGA submission to Ofcom suggested it investigate the possibility and value of vertical investment partnerships for NGA development between service providers and operators in addition to horizontal ones between operators. Horizontal partnerships may optimize traffic sharing arrangements and network efficiencies (and thus maximize ease of revenue sharing). But as they would generally involve similar and longer term partners than in vertical ventures, they could also prove difficult to from which to remove regulatory constraints unless the conditions were highly specified. Being limited to network operators, they would also not necessarily have the inclination or capability to maximize dynamic forms of service development or marginal pricing - and would thus circumscribe the potential range of demand drivers for other investors.

26. One of the advantages of vertical partnerships, on the other hand, is that they would allow a much broader range of investors to enter the market, and a greater variability of services to be offered in differing geographic locations. For instance, in higher density areas, joint venture partners might consist of a network operator and a media provider, in a medium density area between a network operator and a large retail outlet, and in a low density area between a network operator and a highway provider (and, perhaps, a car manufacturer?). This would facilitate investment in NGAs through maximise the range of demand drivers, development of marginal pricing and service development.

27. A possible drawback of vertical partnering might be a degree of regulatory complexity in relation to risk-sharing arrangements and their competitive implications. For instance, a joint venture between a network provider and a media company would require different regulatory actions/measures - e.g. a possible need for constraints on exclusive content provision - than those required by a joint venture between a network operator and a highway provider in a different area. But the range of regulatory complexity would possibly decrease over time as initial and short term entrants left and the market became established and more concentrated. These considerations are explored in some more detail in terms of the principles outlined in relation to NGA within Ofcom's consultation paper. This is not because the CBI believes that vertical partnering is necessarily something that could or should occur on a wide scale, but because we believe it is an option that Ofcom could very usefully explore the efficacy of.

## Passive vis-à-vis active infrastructure sharing and risk

28. Regulation of an NGA environment will in some respects be the same as for the existing local, copper-based communications environment. But, as Ofcom recognises, the economic reality of trying to build multiple competing access networks changes the questions concerning SMP, market entry and investment partnering and risk sharing that must be asked - particularly if these networks are to serve well business customers who are generally more distributed than residential customers and who are seeking to target increasingly segmented customer markets in order to realise value adding possibilities.

29. Vertical investment partnering and risk sharing raise a number of questions in regard to those presented in Ofcom's consultation document. While encouraging both vertical and horizontal partnerships maximises possibilities for investor entry and thus competition, it is also useful to recognise that the two may in some ways also be complementary.8 This possibility may be most valuable in areas where the economics of demand would otherwise only really support network provision by one operator. It might also be workable as a joint form of investment between horizontal partnering at a local level and vertical partnering at a sub-loop level. At the latter level, the finer granularity of market segmentation might encourage service providers to offer network operators up-front investment in exchange for pricing discounts or priority transmission for data traffic over a specific period of time.

30. Data privileges that a service provider may want to negotiate with an operator in return for an up-front payment towards investment in NGA rollout in a particular geographical region would be a key issue for Ofcom to consider the competitive implications of and establish regulatory principles for. Would data priority privileges for service providers who pay up-front be allowed at all (in terms of cost or, as or even more importantly, quality of service)? Or would service providers only be allowed to be passive equity owners in any joint venture? Would privileges be allowed for only one service provider (ie exclusivity), a number of such service providers but only those who pay up-front before deployment has begun? Or would any investor wanting to make an up-front payment at any time be allowed to partner (ie total non-discrimination)? Would restrictions need to be imposed on the duration of any such privileges?

31. These are the kinds of questions Ofcom would need to answer to provide clarity to possible investors from outside the operator community if their participation in investing in NGA rollout is to be encouraged. As the questions perhaps indicate, regulation of vertical investment partnering and risk sharing would seem to involve a different balance between ex ante regulation and ex post competition policy in an NGA environment. Because of the more varied type of investment partners involved, vertical partnerships suggest a more active engagement of competition policy with ex ante regulation than is currently the case, or would be so with solely horizontal partnering. This would suggest a greater degree of cooperation between the OFT and Ofcom (as provided for under the Communications Act) than has been the case to-date. But such a greater active engagement and application of competition policy within communications

[8] In fact, despite the schema adopted for indicative purposes here, even horizontal partnerships would of course involve a degree of complementarity between what partners would actually input to a joint venture – as is usually the case now.

service markets might well be a valuable goal if a “liberal interventionist” approach to NGA is to maintain an overall competitive framework.

32. Another area of regulation that will need consideration in relation to service development and investment partnering within an NGA environment is in intellectual property rights (IPRs) protection. While the separation of network and service regulation is a long established principle of the EU regulatory framework, network operators’ own service development has been making IPRs an issue of increasing relevance to them. The issue will be exacerbated in an all-IP environment. While vertical partnering is likely to lessen the impact of IPRs on operators’ NGA development, it may also limit their ability to develop the higher-value services through which NGA promises to increase revenues. Vertical partnerships, by contrast, will enable operators to share in the rewards of demand for higher value service development other than as simple carriers, but may also expose them to increased or unwelcome IPR responsibilities unless traffic management regulations are agreed.